

MOTOR AGE

Vol. IV. No. 5

July
~~AUGUST~~ 30, 1903.

Ten Cents

Highest-Class Automobiles

PANHARD, MORS, RENAULT, C. G. V., MERCEDES

The synonyms for perfection in automobile construction of two continents



PANHARD TOURING CAR
WITH LATEST TYPE ALUMINUM BODY
10-24 H. P.

SMITH & MABLEY

Importers and Manufacturers' Agents

513-515-517-519 Seventh Ave., New York

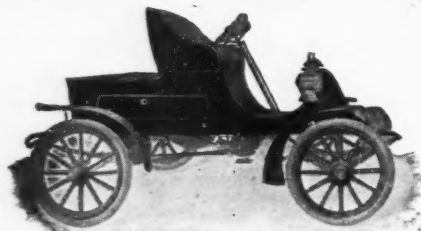
THE ELMORE MFG. CO., Clyde, Ohio.

Gentlemen:—Now what do you think of us? We arrived home last Sunday about 7 o'clock without a bit of trouble, just four days' run. Did not have even a puncture or any trouble whatever. Came over 500 miles on all kinds of roads, got in mud up to the hubs at Terre Haute and Bellefontaine, but the machine went through like a bird, and it is putting it mildly when I say that I am delighted with the Elmore. :: Hoping I may get some of my friends interested enough to do you some good, I am,

Yours respectfully,

FRED. S. CLAPP.

Washington, Ind., May 18th, 1903.



YOU NEED IT IN YOUR BUSINESS

The Elmore Automobile

is the most simple, practical and reliable car ever put on the market. It is propelled by the famous Elmore motor, whose two cylinders have fewer parts than a single cylinder of any other type.

Either engine will propel carriage should the other be cut out. (A very important fact.)

Has dynamo and storage battery. Motor will start and carriage will run on either. (Another important fact.)

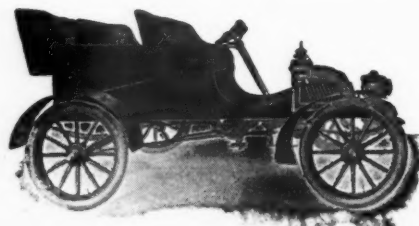
You can charge the battery from the dynamo while running the carriage, which is another important fact.

Has had a practical test of over three years' manufacture.

Two first-class certificates in New York-Boston Endurance Run. Have been used in 1000-mile tours without trouble. And still more important facts.

Doctors' and Business Men's favorite car, Model 7, \$800

Tonneau Touring Car, Model 8, \$1400



LOOK UP! WRITE! INVESTIGATE!

ELMORE MANUFACTURING COMPANY

Member of Association of Licensed
Automobile Manufacturers.

Clyde, Ohio

Service is the Chief Consideration in an Automobile.

THE GENERAL WAS BUILT FOR SERVICE

It has been aptly described as the return-trip automobile. Its working parts are few and durable; the control is secured by frictional brake bands which are operated by single lever for forward changes and by treadle for reverse—these parts are made heavy and careless handling can in no way injure them; fuel is fed automatically, regardless of all changes of speed; and lubrication is automatic.



Most men are not mechanics. The General is built without complex mechanism. The detail of its management can be mastered simply and quickly. It is impossible to lose control of the General. Considering the solidity of its performance and the thoroughness of its work it is the cheapest automobile on the market. Price, \$900. Price, with Tonneau seating four persons, \$1000.

GENERAL AUTOMOBILE MFG. CO.,

CLEVELAND,
OHIO.

MOTOR AGE

VOL. IV. NO. 5.

JULY 30, 1903.

\$2.00 Per Year

RECORDS GALORE BROKEN AT EMPIRE CITY TRACK

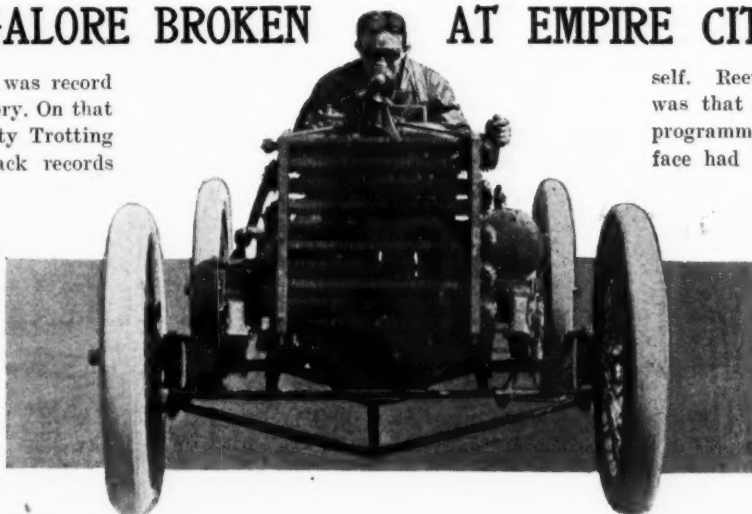
New York, July 27.—Saturday was record day in automobile track racing history. On that day at the meet of the Empire City Trotting Club, at Yonkers, six world's track records went by the board, also the records for gasoline vehicles under 1,800 pounds, from 1 to 10 miles, and those under 1,200 pounds from a mile to 10 miles. Oldfield's old scores, from 2 to 10 miles alone remained of the speed marks of the past.

Greatest feat of all was the lowering of the mile, standard for speed, from 56 2-5 to 55 4-5 seconds.

In the number of entries the meet was a record-breaker. There were over fifty of them. A record-breaker, too, it was in the number of automobiles that bore spectators to the meet. There were 303 of them grouped on the lawn and beneath the stand by actual count. This did not include the racing machines in the sheds behind the club house.

There were 6,000 spectators. That is a record breaking attendance for a New York meet, where horse races, bicycle contests and ball games enter into competition for the patronage of admission paying sport followers.

Anyhow, the record breaking, the matches, the open races, the attendance, the gathering of motor interests, the management, and the enthusiasm establishes automobile track racing



MOTOR AGE

Barney Oldfield

beyond peradventure as a popular sport with New Yorkers so long as it is promoted with the liberality President Butler showed and the perfection of details that Secretary Reeves's talent in management once more displayed. Nor should there be omitted a word of recognition of the valuable services rendered by A. J. Picard in securing most of the magnificent entry list by personal solicitation, and as a clerk of the course in running off the lengthy programme with promptness.

The officials from A. R. Pardington, chairman of the A. A. A. racing board, to Peter Prunty, "the human megaphone," who acted as announcer, knew their business and ran things without a hitch.

The event of the day was carded as the 5-mile heat match between Barney Oldfield and F. A. La Roche. So also was looked for a breaking of the mile record, if any alteration of the world's track figures was to come.

Oldfield wanted a new mile record for him-

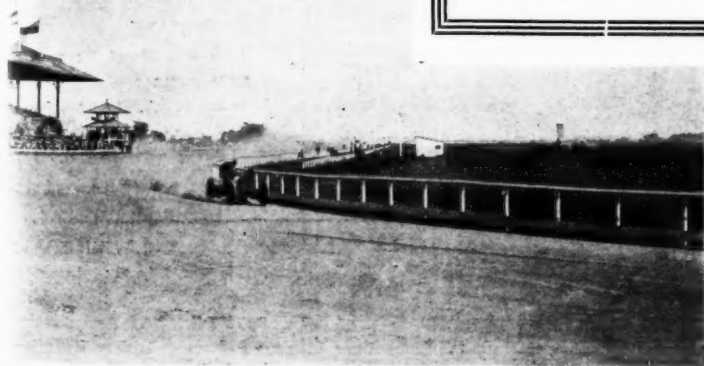
self. Reeves wanted it for the track. So it was that with wise forethought early in the programme before the carefully prepared surface had had a chance to be cut up by the

racers that Barney Oldfield came out for his trial, hatless and in his familiar red leather coat. The trial itself followed so quickly as an echo of the announcement of the attempt, that the spectators hardly realized that the great mile was on before Barney was under way.

Starting but 200 yards behind the tape Oldfield seemed hardly under full headway when he struck the wire. Then his machine leaped forward like

an unleashed hound, swept along close to the outer rail, swung sharp at the turn with a convulsive wag that threatened to tear the crazy thing to pieces, turned up a cloud of dust that hid Oldfield from view and smothered the rail-birds, went on its mad flight round the curve, dashed down the backstretch, swept around the lower turn, shook itself and tossed high the dirt as it rounded into the straight and in great leaps with spurting flames and thunderous clamor finished the mile in faster time than any motor driven thing had ever before encircled a mile oval.

Such was Oldfield's world's record mile in 55 4-5 seconds. It was a thrilling and awe in-



GROSSO, Mercedes, Leading in 15-Mile Match Race

MOTOR AGE



The Automobile Gathering on the Lawn



W. D. Gash Attends with the First Completed of the New Four-Cylinder Searchmonts

MOTOR AGE

spiring sight to see. Women's faces had blanched and the hearts of some veteran automobile race followers stood still.

And yet the Europeans say Americans cannot build racers. Rot! Just wait until our own dare-devil Barney gets the chance he is seeking for a straightway mile trial and your Herr Jenatzy, your Monsieur Augiers, and your Mr. Edge may open their eyes to the fact that there is "something doing" over on this side of the big pond. If 55½ around a circular track isn't as good or better than 46 straight-away on the Dourdan road, for pity's sake give Barney a chance to "make good" and undecieve a lot of deluded Americans.

It was a game but futile display of sportsmanship for Mr. La Roche to face Oldfield for a match, equipped only with a 35-horsepower stock Darracq in place of the "70" racer he has ordered and expected.

But Mr. La Roche is gritty. Many will remember how he persevered against all obstacles and accidents and got his car through the New York-Boston run last October and how enthusiastically he entered in the racing game at this same track on Decoration day.

Mr. La Roche was beaten in the match, of course—by a mile—the first heat starting from opposite sides of the track, and by a quarter of a mile further the second heat from a side by side send-off. Later this good sportsman had the consolation of seeing his Darracqs win the 1,800 pound race in class record time and secure two second cups in other events.

There were other special match races. Most important of them was the three-cornered race among O. W. Bright's 60-horsepower Mercedes, driven by Laurent Grosso, J. R. Chisholm's 40-horsepower Decauville piloted by Henri Page, and the Mooers' international cup racer steered by Charley Wridgway. The last named flyer had arrived but 2 days before and was hardly in shape for a race, but Wridgway had allowed the an-

nouncement of its participation in the match to be made and would not allow the public to be disappointed in seeing the flyer go through a canter. The great Mercedes won by ⅔ of a mile from the Decauville and wiped out Bostwick's world's track figures for 11, 12 and 13 miles scored on this track 2 years ago, and Fournier's marks for the two succeeding miles.

There was a 10-mile match between Joe Tracy in a Renault and John Wilkinson in a Franklin, both of 10 horsepower. The Syracuse flyer made a runaway of the race, beating the Frenchman by ⅔ of a mile, and breaking the records for 1,200 pounders from 6 to 10 miles.

Not only in match but open racing did the Franklin air-cooled flyer prove a winner and a record breaker. As a matter of fact this same Franklin was the only American made machine to win a first or even get a second prize in an open race. It beat a bevy of little fellows as easily as it had beaten the products of the famous French building of light racing cars. Jumping away in the lead at the pistol



MOTOR AGE

Thomas Hillard and Norris Mason See Races from a Panhard

selves in the 1800-pound class. A Decauville, a Panhard and two Darracqs competed. The Decauville and the 40-horsepower Darracq had Jules Sincholle and George Papillon respectively to pilot them. These same drivers had driven these same machines, it was said, in the Paris-Madrid contest. The race was between the two

all the way. The Darracq beat the Decauville by a third of a mile, with the other Darracq but 100 yards behind. New class records all the way resulted.

The race of the big fellows in the free for all promised great sport, which unhappily accidents soon marred. M. C. Herman's 70-horsepower Panhard was expected to do much and started to do it from the jump. It led by 100 yards at the mile, followed by the Decauville. At this point a screw in the valve

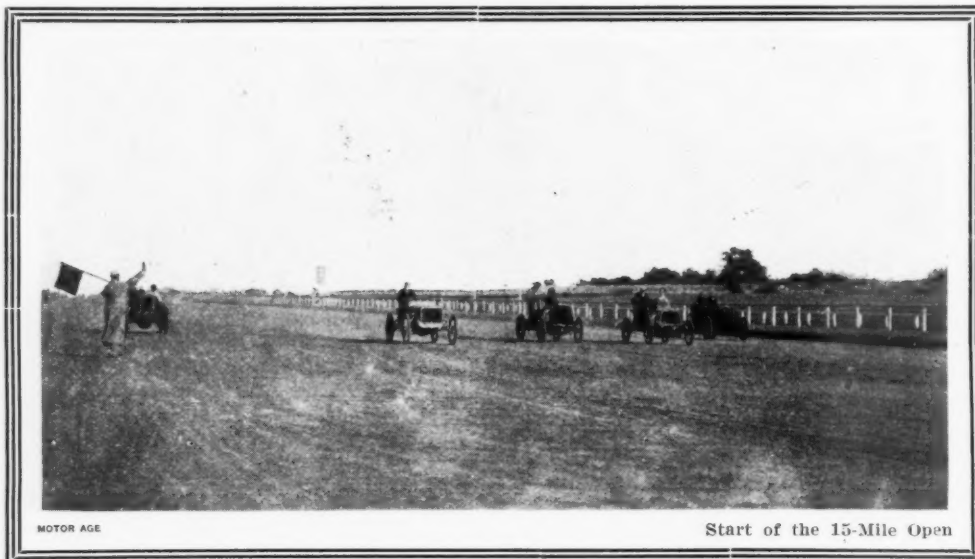
spring broke and left it stranded. The Decauville and the Darracq took up the running hammer and tongs. The latter got by and was re-passed in the third mile. The Decauville flyer won by a mile and a quarter at the end, the Darracq having fallen far in the rear, owing to a tire going wrong. A 35-horsepower Darracq driven by George Papillon was second.

Such were the events that sustained interest throughout the afternoon, convincing the spectators that American automobile track racing is a sport unto itself and equally as deserving of continued recognition as European styles of road racing.

THE SUMMARY

Five-mile heat match race, standing start—Farney Oldfield versus F. A. La Roche, Darracq—First heat won by Oldfield by a mile in 5:09 4-5; intermediate times, 1:11 3-5, 2:12 2-5, 3:12 2-5, 4:11. Second heat won by Oldfield by 1¼ miles in 4:55; intermediate times, 1:02 2-5, 2:00, 2:58 3-5, 3:56 1-5.

Fifteen-mile free for all—Won by J. R. Chisholm's Decauville, driven by Henri Page; American Darracq Automobile Co.'s

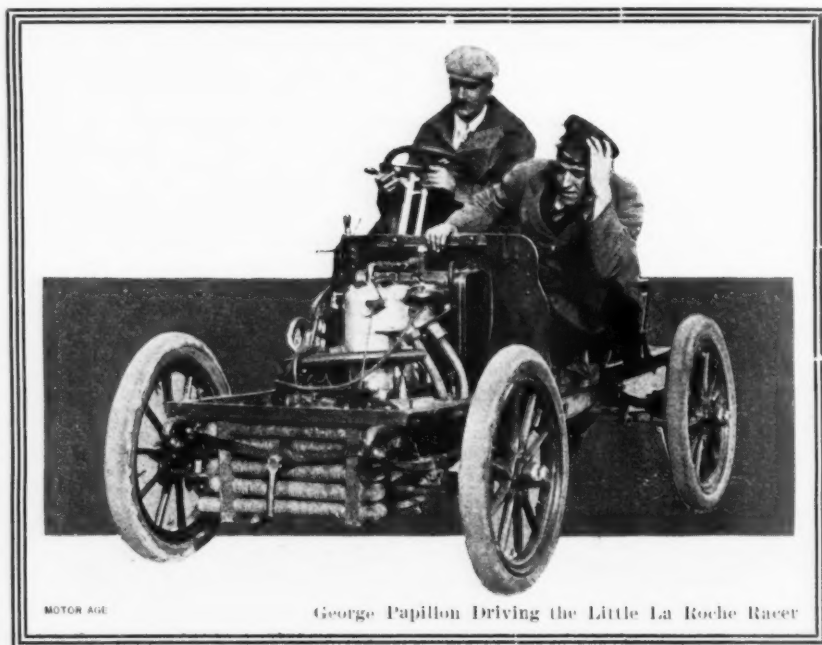


MOTOR AGE

Start of the 15-Mile Open

it gained rapidly to the end of the five miles and won by three-quarters of a mile from Col. Harlow's Darracq, which beat Mr. La Roche's own creation by only 50 yards, a saucy little Orient Buckboard being an eighth of a mile further to the rear. New class records were made by it the whole journey.

The foreigners had the racing all to them-



MOTOR AGE

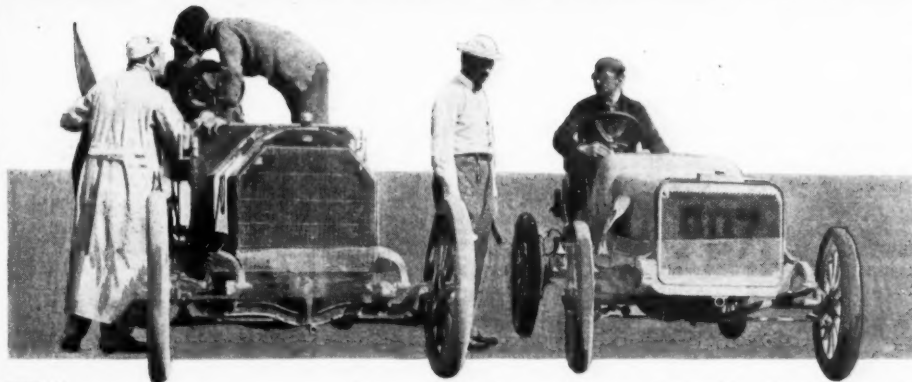
George Papillon Driving the Little La Roche Racer

Darracq, driven by George Papillon, second; F. A. La Roche's Darracq, driven by Jules Sincholle, third. Time, 16:39 2-5. M. C. Herman, Panhard, and C. G. Wridgway, Peerless, also ran.

Ten-mile race for cars under 1,800 pounds—Won by F. A. La Roche's Darracq, driven by Jules Sincholle; J. R. Chisholm's Decauville, driven by Henri Page, second; American Darracq Automobile Co.'s Darracq, driven by George Papillon, third. Time, 10:52 4-5—world's record for this class. Intermediate times of winner, 1:13 4-5, 2:17 1-5, 3:21 1-5, 4:25 2-5, 5:29, 6:32 4-5, 7:37 1-5, 8:41 3-5, 9:47, all world's track records for this class.

Fifteen-mile match race—Won by O. W. Bright's Mercedes, driven by Laurent Grosso; J. R. Chisholm's Decauville, driven by Henri Page, second; Peerless Motor Car Co.'s Peerless, driven by Charles G. Wridgway, third. Time, 16:10 4-5. Winner's time for intermediate miles, 1:10 2-5. 2:14 4-5, 3:19 3-5, 4:23 4-5, 5:28 2-5, 6:33 2-5, 7:38 1-5, 8:43 1-5, 9:47 2-5, 10:51 3-5, 11:56, 12:59 4-5, 14:03 4-5, 15:07 2-5, 16:10 4-5. World's track records, 11 to 15 miles.

Ten-mile match race—J. Insley Blair's Renault, driven by Joseph Tracy, versus H. H. Franklin Mfg. Co.'s Franklin, driven by John Wilkin-



MOTOR AGE

Grosso, Mercedes, and Page, Decauville, Starting in 15-Mile Match Race



MOTOR AGE

La Roche on His Darracq

WORLD'S TRACK RECORDS

BEFORE		AFTER	
1 mile..	:56 2-5 Oldfield	:55 4-5 Oldfield	
2 miles.	1:55 Oldfield	1:55 Oldfield	
3 miles.	2:55 Oldfield	2:55 Oldfield	
4 miles.	3:55 Oldfield	3:55 Oldfield	
5 miles.	4:54 Oldfield	4:54 Oldfield	
6 miles.	5:54 1-5 Oldfield	5:54 1-5 Oldfield	
7 miles.	6:55 1-5 Oldfield	6:55 1-5 Oldfield	
8 miles.	7:55 1-5 Oldfield	7:55 1-5 Oldfield	
9 miles.	8:54 4-5 Oldfield	8:54 4-5 Oldfield	
10 miles.	9:54 4-5 Oldfield	9:54 4-5 Oldfield	
11 miles.	14:02 2-5 Bostwick	11:56 Grosso	
12 miles.	15:21 Bostwick	12:59 4-5 Grosso	
13 miles.	16:38 4-5 Bostwick	14:03 4-5 Grosso	
14 miles.	17:55 3-5 Fournier	15:07 2-5 Grosso	
15 miles.	19:10 4-5 Fournier	16:10 4-5 Grosso	

Machines driven: Oldfield, Ford-Cooper; Bostwick, Winton; Fournier, Mors; and Grosso, Mercedes.



Picard



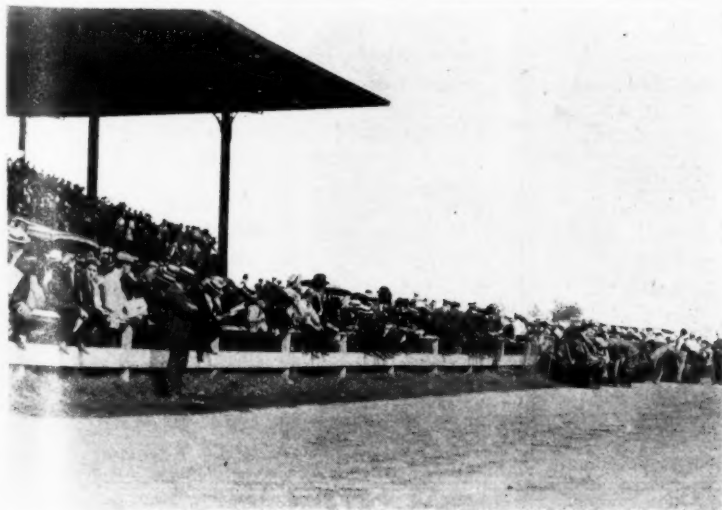
Reeves

son—Won by Wilkinson in 15:50 1-5; Tracy's time, 17:07 4-5. Winner's time for intermediate miles, 1:27 3-5, 2:54 4-5, 4:23 4-5, 5:51, 7:25 4-5, 9:03 4-5, 10:14 3-5, 12:15 3-5, 14:48 — world's track records for 1,200-pound class from 6 to 10 miles.

Five-mile race for cars under 1,200 pounds—Won by H. H. Franklin Mfg. Co.'s Franklin, driven by John Wilkinson; W. P. Harlow's Darracq, driven by L. O. Gitchell, second; F. A. La Roche's La Roche, driven by George Papillon, third. Time, 6:54 3-5—world's track record for this class. Winner's time for second, third and fourth miles, 2:46 2-5, 4:08 2-5, 5:30 2-5 — all world's track records for this class.

One-mile trial for world's track record—Barney Oldfield, time, :55 4-5, breaking former track record held by himself of :56 2-5. Times for quarter, half and three-quarters, 15 seconds, 28 seconds, 41 seconds—all world's records.

One-mile record trials, flying start — O. W. Bright's Mercedes, driven by Laurent Grosso, 1:03 1-5; M. C. Herman's Panhard, driven by owner, 1:05 2-5; J. R. Chisholm's Decauville, driven by Henri Page, 1:07 1-5; Peerless, driven by C. G. Wridgway, 1:09 3-5; F. A. La Roche's Darracq, driven by Jules Sincholle, 1:15 2-5; Franklin Mfg. Co.'s Franklin, driven by Wilkinson, 1:20.



The Bull Birds



The Franklin Winning the 10-Mile Match Race

MOTOR AGE

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CONDITION OF THE TRADE

Despite popular opinion to the contrary there is nothing in sight to warrant the investment of capital in new automobile enterprises. There are two great obstacles which no capitalist can afford to overlook, viz.: The condition of the factories as related to the demand and the Selden and other patents owned or controlled by the Association of Licensed Automobile Manufacturers.

Each is important but the conditions governing supply and demand are in this case, as in every other, the prime consideration.

Common gossip, among those who are unfamiliar with the conditions existing in the factories, has it that the demand exceeds the supply; that the increase in demand in 1904 will be proportionate to that of 1903; and that for 3 or 4 years, at least, there will be room for more and more factories and for increased production by those already existing. But gossip is, as usual, wrong. It will come as a surprise, perhaps, to many, to learn that a large majority of the leading factories have already caught up with the demand for their goods. But the statement is absolutely true. The remaining gossip is based on imagination and calculation made without knowledge of the truth of the statement above made. Can any careful business man find encouragement in all this to invest funds in new enterprises?

Assuming, for the sake of argument, that there is a proportionate increase in demand next year, is it true that new factories are needed to meet it? Emphatically, no. The facilities of the factories now operating will be so greatly increased as to take care of all requirements. At the commencement of this season, how many factories, now fully ready for business, were in the earliest stages of production? A few only—as for example the Locomobile, Electric Vehicle Co., Pope Motor Car Co., Stearns, Cadillac, Thomas, Premier—need be named to show the well-informed trade man how enormous will be the increase now that all of such concerns are fully equipped, and that they and the other factories now fully ready, will be able to cope with all the increased demand it is reasonable to anticipate. These factories are run by men backed by capital, organization and reputation. They can manufacture cheaply and well. They sell to the best agents. They may even be able to go so far as to induce the best agents not to handle goods made by makers of less repute.

The attitude of the Selden association has

been, and continues, mildly aggressive. That its work will be conducted with care, conservatism and consideration for the rights of outside makers may be gleaned from the fact that only after 2 days' deliberation was that warning which appears in the advertising columns of this week's issue authorized. But the association, while respecting the rights of makers who are not, and may never become licensees, does not intend to tolerate abuse of its own. It has the use of over 400 patents, among which may be found a diversity of material which the utmost care cannot totally avoid infringement and possible legal entanglement, yet it has merely served notice of its intention to protect the rights of its members that they may obtain a legitimate reward for their expenditures of time, money and brain work during the last decade.

The officers of the association claim that 90 per cent of the gasoline vehicles made in the United States this year will come from the factories of licensees. Assuming this to be true it follows that about one-half of the concerns claiming to make gasoline cars are, in reality, still in the experimental stages or producing only on a small scale. Some of these will grow and become great, adding still further to the general production. Others, for one reason and another, will retire, some taking advantage of the association's offer of a license to finish the cars already started and retire at the end of the season with as little loss as possible.

It matters not, for the purposes of this article, whether the Selden association is in the right or in the wrong. Those who are still independent must, and of course will, decide for themselves whether, in the event of failure to secure licenses, they will best serve the interests of those financially interested by fighting for the right to continue or retiring from the field. But for the interests of everyone

now in the field and of those who are contemplating entering, it is desirable that there be few, if any, additions and that the few are made thoroughly acquainted, in advance, with the conditions it will be necessary to face.

WRONG END AHEAD

The holding of the Gordon Bennett race and events of the Irish Fortnight has demonstrated a fact that might well be kept in view by those in charge of future occasions of a similar nature.

The one great event of the fortnight was run first. Then came a series of lesser events, held in different places, with a caravan of followers of the sport going about from place to place.

The caravan, however, gradually became smaller and smaller, and the events lesser and less in importance.

The program had been run backwards. Had the fortnight been so arranged that the great international event would be its climax, a steadily increasing interest could have been sustained through the 2 weeks of sport and pastime, ending with an occasion whose own natural interest would be surcharged with the vigor of the gradually increasing keenness for motor competition.

AIR-COOLING INCREASES

At least a half-dozen concerns are experimenting in the construction of light cars equipped with air-cooled motors. Several of these are actively engaged in preparing to market cars of this description. These, added to the cars already on the market, will greatly strengthen the ranks of such automobiles.

It represents a line of motor car development which is attractive to the average purchaser of a small car; for it tends toward extreme simplicity—and an automobile can never be too simple to suit the user, so long as the actual necessities are not skimmed.

Motoring Illustrated, of London, England, contains the following caustic criticism of the Bailey bill: "There are almost as many signs of common sense lacking as are evident in the Bailey bill, which recently became a law in New York state. That bill enacts that a motor car must pass a schoolhouse full of pupils and a church full of a congregation at 8 miles an hour. When the school children and congregation are scattered in the highways and danger really begins, you may drive at 20 miles an hour!"

A new road is being constructed from Songo-lodo on the Congo railway, in Africa, to Popokabada on the Kuango. The distance is about 310 miles, and the road, which is to be 9 yards wide on the plain and 5 yards wide on the mountain, is built especially for traffic by the new motor wagons ordered by the British government. These vehicles will haul loads of 2 tons over the road at the rate of 20 miles a day.

"Children playing on the main road now is a dangerous pastime," is the somewhat ungrammatical way the Maidstone Journal, of London, England, puts it; but nevertheless, there is some truth concealed in the sentence, and wise parents should ferret it out and learn the moral. "A child in the house is worth two in the road"—when a motor car is coming!

In answer to an advertisement for a chauffeur an Englishman recently received the following reply: "I can take a car to pieces quicker than anybody I know."

A REMINDER THAT

FOUR YEARS AGO LAST WEEK

Rene de Knyff, on a 16-horsepower Panhard, made the best record in a 1,428-mile tour of France, in which twenty vehicles started. De Knyff's running time was 44 hours, 44 minutes and 9 seconds.

THREE YEARS AGO LAST WEEK

The first outdoor automobile race meet ever given in this country was held at Branford, Conn., on a half-mile dirt track. The winners of the heats in the 5-mile motor carriage race were H. P. Maxim, E. A. McDuffie and K. A. Skinner, with times of 10:49, 10:37 and 15:47, respectively.

TWO YEARS AGO LAST WEEK

The Hartford Rubber Works, of Hartford, Conn., announced that it would assume the manufacture of Dunlop tires, previously carried on at Belleville, N. J., by the American Dunlop Tire Co.

ONE YEAR AGO LAST WEEK

Fourteen automobilists started in an 100-mile endurance run at Kansas City, Mo.; plugged in the rain through mud, and finished to mingle in a dispute with and among officials over the award of certificates.

PACKARD OVERLAND PARTY REACHES DENVER



Rough Road in Soldiers' Canon

MOTOR AGE

Denver, Col., July 21—The arrival of the Packard trans-continental car from Colorado Springs yesterday afternoon stirred this city to a more than ordinary interest in automobile affairs. The car, driven by E. T. Fetch, and with M. C. Krarup occupying the other seat, had started from the springs at 10 o'clock in the morning, and would have covered the distance, 75 miles, before 3 o'clock, but for the reception accorded the travelers en route. When 18 miles from the city they were met by the four gentlemen representing the Packard Motor Car Co.'s interests in Denver; namely, George Gorton, of Warren, Ohio, who is temporarily here as demonstrator; J. H. Nichols, Jr., O. T. Higgins and George Hering, the local agents, who had with them a representative of the Denver News.

WARM WELCOME AT DENVER

The Old Pacific, as the car has come to be known after completing the most arduous portion of its unique trip, and Messrs. Fetch and Krarup, were cheered to the echo. The car was looked over and its good condition caused remarks of admiration for the skill of the operator in taking it so safely through the rough sections of Nevada, Utah and this state. Then the course was continued to Littleton, 8 miles farther, where the Denver Automobile Club had assembled to do honor to the travelers.

Cheering was renewed and all business jealousy between various manufacturers of automobiles seemed to have been set aside for this occasion. The White steam tonneau, four Rambler cars, two Locomobiles and one St. Louis car were represented, the occupants

being the best known automobilists of this city, including the secretary of the automobile club, Dr. W. H. Bergtold. Others were E. R. Cumbe, C. V. Dasey, E. W. Swanborough, George E. Hannan, Benjamin Campbell, Charles Bilz, George E. Fell, W. F. Frazier, Joseph Mino, Mr. Joslyn and several ladies.

FAST TRIP TO TOWN

On the way from Littleton to this city the pace was faster than any indulged in by the overland travelers on previous occasions, Denver motorists being still partial to high speed.

Arrived in Denver, a circuitous route was followed through the principal streets to the Packard agency, giving all the population an opportunity to realize that the most difficult and perilous portion of great motor car performance had successfully finished.

LEAVING CARSON CITY

The trip from San Francisco to Reno was described in a recent issue of MOTOR AGE. This town was reached at 9:35 Thursday morning, June 25, the car having made the run from Carson City in about 2½ hours without difficulty of any kind or incidents worthy of note.

From Reno on Thursday afternoon an uneventful trip took the travelers to Wadsworth, 35 miles distant, where the difficulties were supposed to commence, for Wadsworth is a mean little railway station situated at the bottom of what seems to be a kettle of low hills from which no exit is provided except by plowing through sand of the worst description. The departure from this town was delayed a whole day by failure to receive gasoline freight bills, photographic films and other mail and express matter in time, and the day of waiting was rendered still less acceptable by the stories told of disaster which had overtaken another party in an attempt to cross the sand hills and the plains immediately adjacent.

PREPARE FOR THE WORST

When the start was finally made on Saturday morning many of the townspeople had gathered at the top of the ominous hill, one of them provided with a team, rope and tackle that he expected would be called into requisition for drawing the automobile over the diffi-



MOTOR AGE

In Soldiers' Canon, Utah

cult spot, but provisions had been made by which this kind forethought on the part of outsiders had been rendered unnecessary. The car carried two strips of canvas each 20 feet long and about 6 feet wide, with the idea in view that, if traction failed in deep and dry sand, the canvas could be spread over the ground and the car be driven without sinking into it too deeply.

This plan was carried out, and it was with surprise that the Wadsworth people saw the car rise slowly but surely over the steep grade and finally pass by them. They cheered, and even the man with the team took his disappointment in good part. For more than 10 miles thereafter the road lay through deep sand, and twice more recourse to the canvas was had in order to pull through. A little canvas awning had been built out over the front end of the car to shield the radiating coils from the direct rays of the sun, but even with this precaution it proved necessary to go even more slowly than the sand compelled, so as to avoid overheating, so fierce was the heat, so

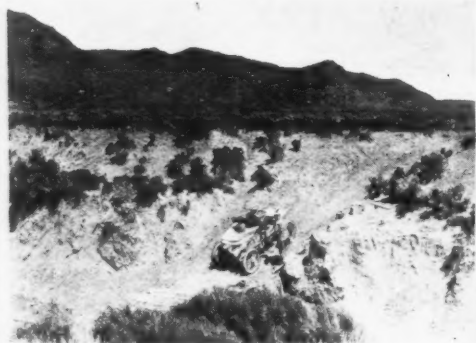
still the day, and so unceasing the hard work imposed upon the motor.

About 3 hours and a half elapsed before the car had traversed the first 12 miles out of Wadsworth, and an idea may be formed of what this kind of sand means to the motor tourist, when it is noted that on a 14 per cent grade it was necessary to drive on the low gear in order to reach the bottom; the car refused not only to coast, but none of the higher gears would budge it. These trials over, the rest of the way to Lovelocks was found to afford com-



MOTOR AGE

The Arrival in Denver



Up Steep Grade in Castle Valley, Utah



MOTOR AGE Along Edge Uinta Indian Reservation



Ready for Ascent, Dun's Glen, Nev.

paratively easy driving, much of it over white alkali plains where the footing was quite good, owing to continued dry weather. Late in the afternoon the first tire accident took place, due to a nail in a board lying in the road. Twenty minutes were required to pull out the injured section of the inner tube, put a patch in it and get it back into place.

Finally Lovelocks was reached at 7:12 o'clock, and it was found by stick measure that the motor during the day, in spite of its hard work, had consumed only 6 gallons of gasoline. Before reaching Lovelocks the car had passed over a corner of the Humboldt river sink, where this important water course disappears in the ground after serving to irrigate and fertilize innumerable ranches and farms in the valley extending for several hundred miles north and east. The course of the car lay henceforth for several days along the Humboldt river with an occasional crossing of the mountain ranges which shoot into it at irregular intervals. In this valley Lovelocks is the first important town, and it is far from presenting the appearance of a desert in its immediate vicinity. In this town the travelers were received with open arms and the car made such an impression of power and strength that some persons actually thought it might succeed in getting across the desert.

THIRD MAN TAKEN ABOARD

A third man had several days previously been added to the party. N. O. Allyn had joined Messrs. Fetch and Krarup at Reno, after it had been demonstrated that the motor could easily handle mountain grades and rough ground. It had been considered desirable that Mr. Allyn, who is an expert machinist, should

travel by rail, following the car within call by wire, so that the others would not be entirely dependent on local skill in case the car should be ditched or otherwise injured on those nar-

three travelers were unfamiliar. He continued with the party from Reno to Colorado Springs, seated on the baggage when the car was in motion.

RAPID DESERT TRAVELING

The following day, Sunday morning, the start was made at 6:12 o'clock, with the good wishes of the whole town accompanying the trio. It was only a short ride until the desert proper was again reached, where sand and sage brush and alkali reigned supreme. Close to the river, where no irrigation has yet been established, the surface was deeply furrowed by ravines—here commonly called arroyos—with perpendicular walls. To cross these frequently involved a sinuous course of the vehicle, part of which lay in the bottom of the ravine, until a place could be found where the ascent of the opposite brink could be made.

That the road, on the whole, however, was not a difficult one is shown by the time made; for the car arrived at Rye Patch at 8:33, having then made over 25 miles. Here a supply of gasoline, forwarded for the purpose, was found on hand at the station and 8 gallons was taken on board, the two remaining ones of the supply being donated to the town. The vicinity of Rye Patch abounds in short hills with grades up to 23 per cent, most of them being the ups and downs of the ravines mentioned, where the soil seems like a marl which pulverizes as fine as flour under rubber tires.

RESULTS OF IRRIGATION

At 10:40 o'clock the Humboldt house was reached, and its surroundings show the immediate proximity which can exist between desert and oasis. On one side the snow-clad moun-

Between Woodside and Thompsons, Utah



MOTOR AGE In a Land Full of Boulders

row roads where accidents might occur. So far, however, his services had never been required, and, the inactivity being irksome, he asked the privilege of going with the car to see at near hand the scenery, with which all of the



Not as Bad as Soldiers' Canon



Running into Colton, Utah

tain range looms up and the stony ground hardly leaves room for even the sage brush to take root; on the other side a few acres surrounding the Humboldt house show a luxurious vegetation and the green foliage of large trees, all the result of a little bit of irrigation. At this place a crowd of Indians, squaws and papooses, view the expedition curiously, waiting probably to be offered money for the privilege of photographing them; for the aborigines of the state of Nevada have learned to ask money for everything they may do and especially for pandering to the curiosity of travelers.

They hang around all the towns of Nevada doing nothing, and living upon the bounty of the government. Occasionally one of them consents to act as a guide over mountain roads,

be abundantly deep. They took to the hills.

The mountain pass route through Dun Glenn, a mining community where a few old men still dig away for treasure while the more enterprising young men have left for better fields, had many steep grades, but afforded a good surface most of the way, and interesting scenery. The rise in elevation at the summit, compared to Mills City, was found to be about 1,500 feet. Then began the descent, at 4:25 p. m., and this part of the trip was weird and picturesque. Until 5 o'clock the roads continued steep and winding, with many abrupt turns and curves and plenty of places where a car not conducted with caution might fall down some 400 or 500 feet on the rocks. At the bottom of this wild declivity, extending for probably 8 miles, the land spread in a conical

population to wondering what kind of traveling this was. Like Winnemucca, Golconda had never seen an automobile before. Continuing after a short stop for directions, Old Pacific was steered over the nearest mountain range toward Battle Mountain and reached the summit an hour after, with the cooling water nearly boiling, for the day was sultry and calm and the climb of $4\frac{1}{2}$ miles was sufficiently steep to make a total rise of 700 feet. The descent on the other side was an unmixed delight. For 6 miles fine coasting was enjoyed over roads to all intents and purposes equal to gravel walks. Then came the bottom flat, covering some 5 miles, where the alkali shone like white enamel, and out of which little bushes of sage protruded at intervals of from 20 to 30 feet. Then followed a plain level wagon rut trail,

Among Sand Hills of Southeastern Utah



How Fetch Got the Car Out



In the Middle of the Desert

MOTOR AGE



In the Sand near Thompsons, Utah

but as a rule they pass their time either loitering in the shade or riding on top of freight trains, which by consent of the railroad companies they are permitted to do free of charge. Mills City, so called from an old mill located there, was reached at 11:42 o'clock, cyclometer 555 $\frac{1}{2}$ miles. The thermometer at that time was 90 in the shade, the barometer 25.55, indicating an altitude of about 4,400 feet.

CROSS HILLS TO AVOID SAND

It was known that the sand between Mills and Winnemucca, the next town, would present difficulties exactly similar to those met and overcome out of Wadsworth. A conference with the townspeople, who were much interested in the trip, convinced Tom and Chris that it would be more interesting, as well as much wiser, to pass over the mountain visible from the town, rather than to follow the river bottom land, where the sand was understood to

formation of gentle grade to the west, north and east. Descending this grade, the overland car finally reached the sand bottom at 5:20 o'clock, still several miles from Winnemucca. Some hard pulling through this sand now took place, but the delightful discovery was soon made that where the sand was deepest and most impassable, the enterprising citizens of Winnemucca had sent out their squad of road improvers, who had cut down the sage brush on both sides of the track and spread it over the sand, turning it into what is locally called a "brushed road." The effect of this improvement was far superior to that of corduroying.

After dinner the distance to Golconda was made in an hour and 20 minutes, the party arriving there at 2:40 o'clock. Though it had ceased raining, the car was by this time in a bespattered condition that set the Golconda

here and there obstructed by loose stones, but with nothing to hinder the timely arrival at Battle Mountain at 6:17 o'clock, the cyclometer showing the distance traveled just 60 miles during the half days.

PROGRESS OUT OF DENVER

The travelers left Denver Saturday morning, June 25, at 7 o'clock, going 90 miles in 7 $\frac{1}{2}$ hours. The night was spent at Fort Morgan, and on Sunday the trip to Sterling, 50 miles distant, was made before breakfast. On this ride all the leaves in the front spring were broken, compelling the party to rest for the rest of the day. Monday morning of this week the tourists traveled 60 miles to Julesburg, reaching there in the forenoon.

North Platte, Neb., was reached at 6 o'clock Monday evening with everything in first-class condition. The third cyclometer was broken during the day, this being the only accident.

RACES BENEATH ROADSIDE TREES

Speed Trials at Cork, One of the Closing Events of the Irish Fortnight, Conducted on Well Shaded Highway

The speed trials at Cork comprised one of the events of the Irish Fortnight that drew many motorists to that town on Saturday, July 11. The trials were conducted on the Carrigrohane road on the outskirts of the city, in a spot where the picturesque scenery made both spectators and participants feel at peace with all the world. The weather was "the finest in Ireland" and the trees by the side of the road afforded delightful shade.

WELL GUARDED ROAD

The road was closed to the public at 10 o'clock and was protected by the police so that nobody except the officials and the police were allowed upon the road or the footpath. Traffic was suspended on the steam railroad, the rails of which are laid alongside the wagon road.

The first event was an open handicap for vehicles of the tourist pattern. They were divided into five classes, according to price, four of these being for gasoline cars, and one for steam. The first prize, a silver cup presented by the lord mayor and the corporation of Cork, was won by J. W. H. Dew with a 6-horsepower Gardner-Serpollet, the driver being W. J. Warren.

The races were run over a dead straight course of 2 miles. The list of competing cars was as follows:

Class D—Tourist cars costing over \$1,500, but not more than \$3,250, to carry four people. R. W. Leader, 16-horsepower Century, 2:53½; J. Lisle, 10-horsepower light Star, 2:57; H. du Cros, Jr., 12-horsepower light Ariel, 2:58½.

Class E—Tourist cars costing over \$3,250, but not more than \$5,000, to carry four people. George Iden, 20-horsepower M. M. C., 2:48½; J. W. Cross, 20-horsepower Humber, 2:48½; J. Scott Montagu, 22-horsepower light Daimler, 2:51½.

Class F—Tourist cars costing over \$5,000, to carry four people. P. G. Garrard, 22-horsepower Daimler, 3:04; C. W. Hacking, 20-horsepower Panhard, 3:20½.

Class F—Steam tourist cars costing not more than \$4,000, to carry full complement of passengers. W. J. Warren, 6-horsepower Gardner-Serpollet, 2:02½.

In the finals the Gardner-Serpollet made the 2 miles in 2:07½.

THE RACING CAR TRIALS

In the light racing section there was only one driver to put in an appearance. This was E. Brun, driving a Villain car. He covered the course in 2:49½. In the heavy racing car class four cars ran. The result was as follows: C. S. Rolls, 80-horsepower Mors, 1:49½; J. E.

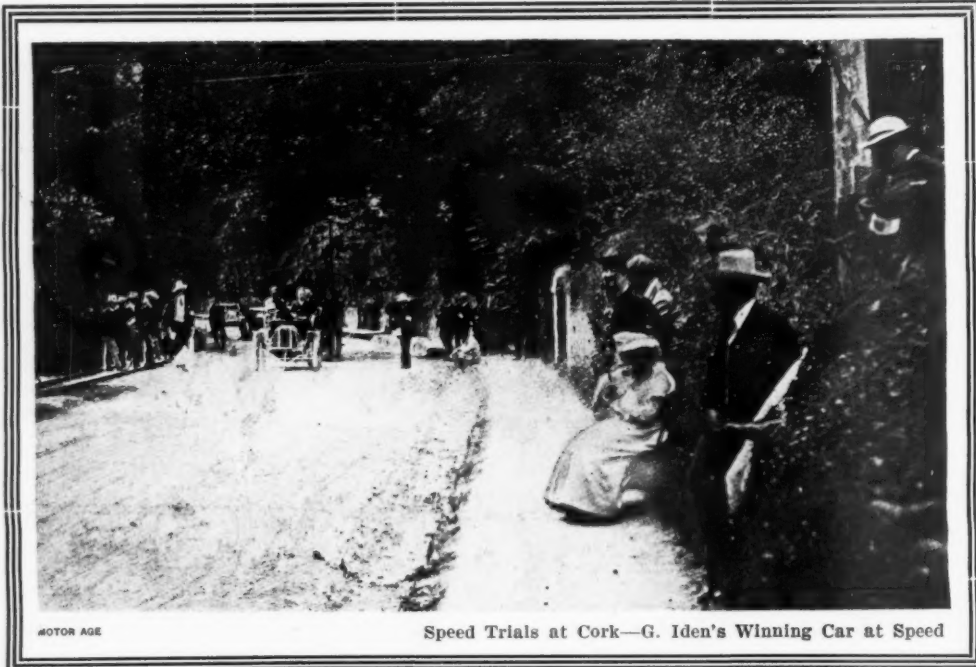
Mansfield Cumming, 50-horsepower Wolseley, 2:00½; S. Higginbotham, 60-horsepower Mercedes, 2:06½.

The cup presented by the proprietors of the Cork Constitution for the best vehicle in this class was given to Hon. C. S. Rolls. The lord mayor, in presenting the silver bowl, said that it was wholly of Irish manufacture, and while made in Cork, was not made of cork.

THE MOTOR BOAT RACE

The motor boat race at Cork did not prove a very great attraction to motorists. The Harmsworth cup event was not international, as the 90-horsepower Mercedes intended for the competition was burned at Cannstadt, and M. Charley's 40-horsepower Mercedes motor was put into a French hull. This was ruled out, under the condition that craft and crew must be from the country competing.

There were only three boats competing, and



Speed Trials at Cork—G. Iden's Winning Car at Speed

Hutton, 60-horsepower Mercedes, 1:52½; Lieut. all were British. The boats were S. F. Edge's Napier, F. Beadle's Durendal, and Mr. Thornycroft's Thornycroft. The Napier was sailed by E. Campbell Muir, covering the 8½-mile course in 24:04 in the first heat. In the final the tide had slackened, and the winner's time was 26:06. The Thornycroft covered the course in 31:14½, and the Harmsworth cup went to the Napier. The Durendal was beaten 3 minutes in the first heat.

The Yachtsman cup was won by the Thornycroft; time, 33:51½.

THE LAST EVENT

The last event of the Irish Fortnight was given on Wednesday, July 15, at Killorglin on the Killarney-Tralee road. It was a hill climbing contest for the County of Kerry cup. On account of the heavy rain the distance was reduced from 1 mile to 1,200 yards. The cup was won by Hon. C. S. Rolls. The time in the final was 1:01½. The racing class was declared void. The attendance was very small, there being only four visitors' cars and about 800 people present.

When the only American-made car that gets a first prize at a race meet has an air-cooled motor that proposition cannot be all wrong.

TWIN CITIES WANT ANOTHER MEET

Pleased with First Experience in Motor Car Racing, Northwest Plans September Events—Minneapolis Club Run

Minneapolis, Minn., July 27—The managers of the Minnesota state fair have decided that, owing to the extensive program to be crowded into the week of the fair, it will be impractical to attempt to hold any motor races. Consequently an agitation has been started for another Twin City race meet, and it has been practically decided to hold the meet on the state fair grounds mile track, at Hamline, immediately after the close of the fair. The day, as now named, is Monday, September 7.

R. F. Jones, of Minneapolis, manager of the automobile and horse meet of a few weeks ago at Hamline, is pushing the proposed September meet. He has the hearty co-operation of the automobile owners and dealers, and it is expected that some genuine attractions will be arranged for the races, which will probably cover 2 or 3 days. Some of the dealers who stripped and rigged machines for the recent races state that there is too much labor and trouble involved and that they will not go to special pains to make fast time in the coming meet. There are plenty of owners, however, and several dealers who will be ready for the races; and those dealers who have declared their intention of staying out of the events are willing

to help in every other way toward making a successful meet.

MORE CLASSES THAN CARS

The Minneapolis Automobile Club gave a short club run last Saturday, but owing to the extreme heat the turnout of machines was not large. The run started at 10 o'clock in the morning and was to Mound City, Lake Minnetonka and return.

Six machines were all of the great number expected that were ready to start. Provision had been made for dividing the rigs into three classes, according to cost. After starting the five machines in the first class at 9:25, it became apparent that the attendance would be small, and W. E. Wheeler's Knox, the only machine ready to start in the second class, was sent away 15 minutes later. Dr. A. A. Law, in a Rambler, set the pace for the first class, and pushed straight through to Mound City, by way of Wayzata and Minnetonka Beach. A bulletin had been published as to the condition of the roads and dangerous points, so the machines were able to make good time. Dr. Law reached the finish at 11:15 and Mr. Wheeler came in at the same time, having made up the handicap.

H. E. Partridge arrived in an automobile a few minutes later. These three were the only machines that went as far as Mound City.

W. Y. Chute's Rambler had a mishap shortly after the start and returned; while R. E. Stoddard and W. M. Adland lost considerable time after starting, and turned back when they met the leaders returning. Mr. Wheeler made the run back from Mound City, a distance of about 29 miles, in 1 hour and 10 minutes.

TO MAKE FIRE SERVICE TEST

Not to be behind the other progressive cities of the country Minneapolis is soon to have an actual test of the automobile in the fire service of the city. The plan for such test originated with Eder H. Moulton, Jr., of this city, who is one of the foremost automobilists of the northwest. As a result of his proposal Chief of Police Conroy and Fire Chief Canterbury have agreed to a test of the automobile in a fire run, and Mr. Moulton will soon give the authorities a record breaking ride in his car, provided a suitable alarm is turned in.

The test will be made with a 16-horsepower Peerless. It is proposed to station the machine at one of the principal engine houses, and on the first alarm, turn out to beat everything else. Mr. Moulton thinks he can convince the fire chief that an automobile would be the best thing in the apparatus line that the city could install.

Minneapolis is admirably suited for the use of automatic fire apparatus, as well as automatic vehicles of all kinds. There are practically no hills and the roads are in excellent shape. Miles and miles of pavement make excellent running. There is not a grade in the city that the lowest power machine cannot take.

The result of the trial will be watched with interest of city officials, as the proposition to use automobiles for the fire chief and assistant chiefs has been broached before.

CLUB RUN A LA BAILEY LAW

Buffalo Motorists Parade Around Town and then Dash Into Country at Terrible Speed of 15 Per

Buffalo, N. Y., July 27—The first run of the Buffalo Automobile Club was given last Saturday, fifty-eight machines starting on the trip, a distance of 27 miles. The start was made at 2 o'clock from the city hall, and besides those who expected to make the run, there were a great number who went to see the start.

President Hotchkiss was the pacemaker and he observed the speed limits carefully. To North street the speed was 8 miles an hour. From this point the speed limit rose to 15 miles an hour. No one went below the limit. The time to Hamburg was 2 hours and 2 minutes, the distance being 27 miles, an average of 13 miles an hour.

Dinner was served at Kopp's hotel to 122 motorists, and then President Hotchkiss made a speech. He told of the efforts relative to the Canadian laws for American motorists. He and others have taken up with the authorities the matter of permitting a numbered Canada license tag to be displayed on the rear of an American car when the new Canada law goes into effect September 1. The start home was made at 8 o'clock and the run was made in a little over an hour.

A Cadillac car with seventeen persons in it was an attraction at Savannah, Ga., a few days ago. The car was driven by R. V. Camerat, and he was simply taking a few of his friends a ride.

JACKSON ENDS TRIP IN FINE SHAPE

First Automobilist to Cross Continent Reaches New York Sunday in 6,000-Mile Win-ton—Last Stage of Trip Easy

New York, July 27—At 4 o'clock Sunday morning was completed the first and longest motor vehicle journey on record. Soon after the rising of the sun a mud-stained automobile rolled into an uptown storage station, and with a sigh of relief the occupants jumped from the car. They were Dr. H. Nelson Jackson, Sewall J. Crocker and "Bud," the bulldog. All three were travel-stained and looked like they had been roughing it. As Bud sat down to rest for a moment and thumped his tail for joy over the completion of the trip, it was noticed by the spectators that the hair was entirely worn off the tail. A graceless newsboy drew attention to this fact by singing: "Oh, the hair on the tail of the dog of the wild man of Borneo did not come to town."

The doctor smiled cheerfully at this sally and joined in the general laugh that followed. Bud also appeared to enjoy the joke.

The travelers went at once to the Holland house where they were soon transformed in appearance, the traces of the journey being all removed except the deep brown tan that had been ingrained upon them in the hot deserts of the west. They were met at the hotel by Dr. Samuel A. Jackson, a Congregational minister of Burlington, Vt., the father, and Mrs. Jackson, the wife of the trans-continental pioneer.

A description of the trip as far as Chicago was published last week in MOTOR AGE. They left that city July 17, arriving here July 26, completing the entire trip of 5,600 miles in 63 days, 19 of which no traveling was done. The journey from Chicago eastward was made without particular incident, the comparatively good roads enabling the travelers to make good time.

Dr. Jackson reduced his weight from 226 to 204 pounds while on the trip. Both the men and the dog are in excellent health as a result of their outdoor life for the past 2 months. After a short rest here, the journey will be continued to Burlington, Vt., the home

of the doctor where a long rest will be made.

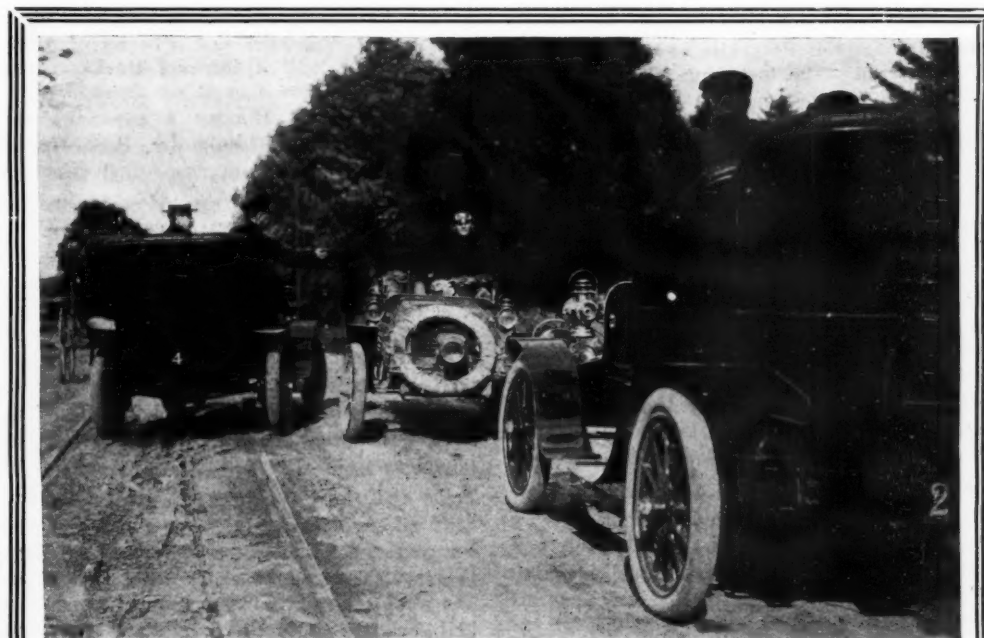
Dr. Jackson is 30 years of age. He is a graduate of the University of Vermont, of the class of '93. Crocker is 22 years old. He formerly was employed as a driver of one of "Dutch" Waller's pacing machines, at the time of the former 6-day bicycle champion's visit to the Pacific coast. Employment in a gasoline engine factory added to his experience with motor cycles and made him the expert mechanic he has proved himself to be through meeting and solving the many problems presented in the long journey.

FIND PLEASURE IN TOURING

Two Parties Motoring Leisurately Through Picturesque New England—Both Started from New York

Boston, July 27—New England is being toured by several parties on pleasure bent. Last week James B. Dill and party of New York, passed through Boston en route to a summer residence in Maine, and this morning George F. Chamberlain, a prominent member of the Automobile Club of America, started on his homeward trip by automobile. In his party were his mother, Mrs. Albert Chamberlain, his brother, A. Ward Chamberlain, and Miss Emily C. Silkman. They drove from New York to Boston, using a White steam touring car, and arrived here on Friday evening. This morning the party left for Portland, and thence will strike off through the regions of the mountains, then down the Connecticut valley for some distance and across Vermont to Lake Champlain. From that point the trip will be down the banks of the Hudson to New York. Mr. Chamberlain has already covered this territory with a drag and four, and found it a most desirable country for touring. He is one of the pioneers in automobiling in this country and has been closely identified with the sport for many years.

The Dill party reached Boston last Monday from New York. After spending a few days in Boston the party continued its trip to the Rangleys, going direct to Portsmouth, N. H., and thence through the White Mountains to North Conway, by way of Dover, Rochester, Milton, Wakefield and Ossipee, through Dixville Notch to the Rangeley's.



MOTOR AGE

Cleveland Clubmen Greeting Dr. Jackson at Elyria, O.

MANY PROMINENT RACERS EXPECTED

Management of the Proposed September Track Meet at Cleveland Hope To Have an "All-Star Performance"

Cleveland, O., July 26—George Collister, who is in charge of the arrangements for the Cleveland September meet, says that without doubt this will be one of the star automobile meetings of the season. Although the entry blanks are not yet out, inquiries are coming from all over the country and the indications are that the best men and machines in the country, and a number of foreigners will compete.

PROSPECTIVE COMPETITORS

The White Sewing Machine Co. is understood to be building a pair of new steam racers which, it goes without saying, are calculated to make great performances in their class. Otto Konigslow, who is now actively in the motor car manufacturing end of the trade, having practically dropped the production of material, is at work on a special light racer. Hedges, it is said, will be here to test the capabilities of the new Matheson car. Paul and Roy Rainey who have recently purchased a 60-horsepower Mercedes will in all probability enter, W. K. Vanderbilt has made inquiries which indicate that he will appear with his new flyer, H. S. Harkness is another interested party, while L. P. Mooers and Percy Owen of Gordon Bennett fame can be depended upon to start. Even Winton may decide to change his mind about retiring from the racing game and make a "last appearance." His friends here are especially anxious that he shall give his new Bullett a thorough trial before the American public, and there would be no better time or place than at the Glenville track in competition with other cars. If Winton himself, will not run the machine, there is little doubt that some other representative of the Winton company will appear. Altogether the Glenville meet promises to be a record breaker.

OVERLAND FROM CLEVELAND

Mr. and Mrs. George W. Kinney and Mr. and Mrs. W. N. Gates of Elyria, arrived in Boston a few days ago after a 900 miles trip from Cleveland. They left Cleveland 2 weeks ago in company with Mr. and Mrs. Windsor T. White, Mr. and Mrs. Roland White, Mr. and Mrs. Charles Hotchkiss and Mr. and Mrs. Fred Borton. The last four couples went to New York and returned to Cleveland by rail.

FOURNIER TELLS OF PLANS

A. G. Batchelder, Fournier's manager in this country, received a letter from him in which he says:

"Please do not allow my friends in America to think I have retired from racing, for such is far from the case. It was only fair that Gabril, having performed so nobly in the Paris-Madrid, should have the place on the cup team. I am only sorry that he did not secure the victory.

"Having been informed that Mr. Winton had no desire for the track races in New York and Cleveland, which I thought were assured when the conditions were signed last winter at the Madison Square Garden exhibition, I have put off my trip to America until December next. I expect to arrange for exhibits of the Hotchkiss car at the New York and Chicago shows, and also for the world's fair at St. Louis.

"If my plans are consummated, I shall attend the Ormond beach races with a racing flyer that will prove a big surprise. Besides, I may remain in your country all of next spring and summer, and then those who say 'Fournier is a has been' will have a chance to find out if such is the fact. Oldfield must be a great driver, but I shall have pleasure in speeding with him. Perhaps it will be real racing when we meet, My nerve is still good, even though I may have added a few pounds in weight."

RACES AT THE CENTENNIAL

Motor Car Parade and Contests Planned for Chicago Birthday—Local Motorists Have Charge of Preparations

This fall the city of Chicago will celebrate its centennial anniversary in a manner planned to surpass all jubilees ever held in this country. The scale on which it is devised, the season of the year selected, and the importance and splendor of the many events will draw to the city great numbers of visitors from neighboring cities and from all over the country.

The motorists of the city have been invited



MOTOR AGE Mrs. D. B. Day, of Buffalo, 89 Years of Age, Taking Her Regular Daily Outing Through Delaware Park in a Morlock Car

to take a prominent part in the celebration, a special committee being appointed to arrange an automobile program. This committee consists of Charles W. Gray, chairman; F. C. Donald, Nelson Barnes, D. Carl Henry, Fred J. Pardee and John W. Kiser.

No definite program has as yet been arranged, but among the events will be a night parade of automobiles and a series of afternoon races at one of the race tracks. At a meeting of the directors of the Chicago Automobile Club last Monday a sub-committee, consisting of F. C. Donald, Dr. F. C. Greene and Frank X. Mudd, was appointed to assist the regular automobile committee in making arrangements for the celebration.

INTO THE BEAUTIFUL YOSEMITE

A successful trip by automobile into the Yosemite valley was made this month by Major J. Fulmer, of Los Angeles, Cal., formerly a resident of Chicago. Major Fulmer was accompanied by his wife, Miss A. L. Wade and A. C. Stewart. The worst part of the trip was over the desert from Antelope to Tejon and along the hot sands of the Bakersfield plains. Some places on the desert the sun was so hot that water had to be poured on the insulation of the spark coils to cool it. The steepest grade was encountered near Newhall, and that was the only place the party was obliged to get out and walk. From Los Angeles to Raymond only \$5 worth of gasoline was used.

MOOERS THE FIRST TO GET BACK

Cleveland Builder and Racer Heads the Homecoming from Scene of International Race —Lays Defeat to Unsuitable Tires

New York, July 26—Louis P. Mooers was the first of the international racers to get back. He came by the Umbria. Senator Morgan came with him. The senator went at once to his home in Newark, Mr. Mooers to the Criterion, where a MOTOR AGE man was the first to greet him.

The Peerless designer seemed to regard his participation in the race as a mere incident of his trip and talked more of European racing, racers and racing machines than of his own part in the contest. Taking it as a matter of course that his interviewer knew that he dropped out on the first round, he did not volunteer to make excuses, merely answering questions and explained:

"The clinch of my tires wouldn't clinch," he said. "I was run into the gutter on the first small circuit near Athy, and it took me three-quarters of an hour to put in an inner tube. This happened again on the first big circuit. This time I ran into a hedge. Luckily it wasn't the usual stone wall. My time cards along stretches before Athy showed 60 miles an hour average, so my machinery was working all right. I proceeded on to Athy again. There I stopped. I was hopelessly behind through delays in making tire repairs and I feared to attempt high speed with them.

TIRE CONSTRUCTION

"American tires are all right for road use, but they are not built to stand the terrific strain of rounding curves in such races. Our makers build the clinches of rubber, the Europeans of fabric. Theirs hold. Ours don't. Then again inner tubes can be put in their tires much quicker than in ours. So the race will teach our manufacturers that much.

"I don't see that the European machines are so very much better than ours as they are cracked up to be. They are better, and I looked them over well at the race and later in Paris, and got some good pointers. What? Never mind. Wait. I have learned a thing or two.

"In chauffeurship and in their knowledge of this kind of racing they are way ahead of us. I watched them closely. They worked quickly in controls and bluffed their way with the officials, who at first sought to prevent them from examining or tinkering with their machines in controls. Jenatz is lightning, but very nervous in controls. Rene de Knyff was the coolest operator. I fancied Jarrott most of the Englishmen.

"We were treated splendidly. The Englishmen did everything they could for us and the Germans and Frenchmen showed us many courtesies.

"I will gladly build another racer and take part in next year's contest. I think we should be in all these races. They will teach us things of great value and bring us into closer competition with the European makers."

SEARCHING FOR MORE MEMBERS

The New York and Chicago Road Association is working strenuously to interest the people along the route of the proposed great highway and in order that they may become directly interested asks that they become members of the association, the annual dues

being only \$1. When the people of every town along the route awoken to the necessity of the improvement and build roads, good at any time of the year, the highway will become a fact.

The proposed route leads from New York city up the east side of the Hudson river to Rhinebeck, then across New York state to Erie, Pa., following the lake shore to Toledo, Ohio, and on to Chicago through northern Indiana, touching at Goshen, South Bend, Valparaiso and Hammond. Some stretches of the road are already improved and work is started in other portions. The more assistance given to the organization, the quicker will the road be built. The co-operation of many municipal councils and commercial organizations has already been secured. Detailed information may be obtained from the secretary, A. H. Battey, 2314A Park Row building, New York.

FOR FOREIGN BUYERS

The Automobile Trust is the sinister name of a producers' syndicate in Paris, France, which offers to foreigners its services in procuring them automobiles at prices less than those of the regular dealers. The trust charges a commission of 25 per cent of the difference between the regular price and the price at which the car is obtained. In no case does the trust require a payment in advance or a provision of any kind. It asks the broker's commission only when the purchase is made.

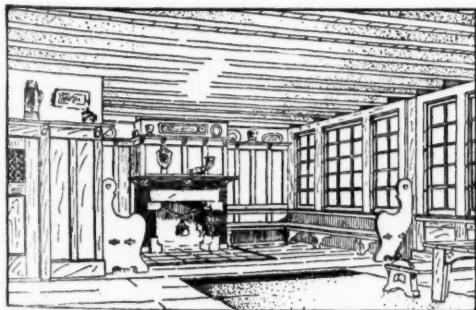
WITH INCREASED CAPITAL

The General Automobile & Mfg. Co., of this city, is now possessed of additional working capital, and expects to soon reorganize under the laws of Ohio for \$150,000 capital, paid in. This reorganization will enable the company to greatly increase both its manufacturing and marketing facilities.

HE WAS THE SMELL

It is time for Mark Twain to revise the story of Tom Sawyer, in which he describes the boys playing steamboat. The boys of the present day now play "automobile." Dr. W. N. McVicar, bishop coadjutor of Rhode Island, recently visited Boston and saw some of the intellectual youths of that city amusing themselves.

The boys were trotting down Tremont street,



MOTOR AGE

Corner of Grill Room

keeping close together. One of them kept saying "Chug! Chug! Chug!" and another occasionally "Toot!" The good bishop asked what they were doing, and was told they were playing "automobile." The one saying "chug" was the motor, the one "tooting" was the chauffeur, and the one saying nothing was a friend taking a ride. The automobile moved on, and the bishop noticed a fourth boy running about 50 feet behind the others, and asked him what he represented.

"Oh, I'm the smell," was the serious answer, as the boy ran on.

UNIDENTIFIED APPEAR IN COURT

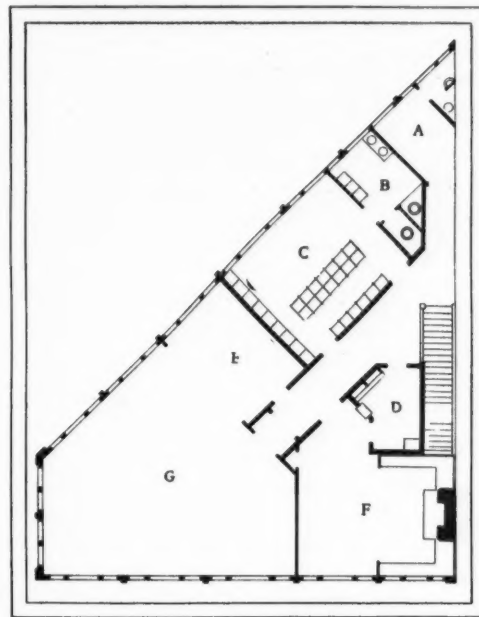
Numberless Chicago Motorists Experience the Thrills of Posing as Criminals—Their Case Continued a Week

Six good men and true, wearing store clothes and a pained expression, were lined up in a row at the Harrison street police station, at Chicago, last Friday morning, charged with the dreadful crime of driving motor cars without numbers. They represented the cream—from the red can, perhaps—of the automobile club, and from the hardened, desperate look on their joint and several countenances, it was plain to the most careless observer that something bad had been done when the stern majesty of the law had swooped down and "grabbed them off" from the public gaze.

An impressive-looking gentleman who seemed vested with authority, lauded vigorously on the railing and said, as he looked sternly at the unfortunate six:

"Be quiet over there and quit talking. We don't want any noise."

The six men shuddered, and although they had not said a word for 9 minutes, they tried to keep even more quiet. The clock ticked loudly, a load of iron rattled over the stony street, and a train rumbled into the Lake



MOTOR AGE

Plan of Second Floor

A—Ladies' Room B—Toilet C—Lockers D—Pantry
E—Committee F—Grill room G—Parlor

Shore station. Beyond these and a few other noises there was not a sound to disturb the stillness.

"I feel perturbed in spirit about this matter," whispered Kanally as he gazed about at the motley array in the courtroom. "Wish I was at home. Don't you, Cook?"

Cook didn't answer because just at that moment a gentleman with a black eye stepped heavily on his toe, for which Cook apologized.

"I've lost a million this morning already," whispered C. B. Slade. "Just got a wireless that a college student was hit with a snowball in Kansas, while all the morning papers say the people out there are suffering from the hot winds. I could have scooped the board today and maybe got my picture in the papers as a Napoleon of finance. I tell you, boys, it don't pay to monkey with the laws, even if they ain't legal." And Slade sighed heavily.

"Think of my patients suffering alone, and me far away in a police court," said Dr. Lowe.

"Cheer up, doc, cucumbers are ripe," spoke up Friedberg, encouragingly.

"Why don't our lawyers come?" said Tarrant, nervously, as he lighted a cigar, and at once extinguished it as he caught a menacing look from the court bailiff.

"You fellows keep still over there," spoke up the worthy bailiff, "or we'll put you down stairs."

Just at this critical moment Attorney Jennings' smiling face loomed up through the crowd as he elbowed his way to the desk. In a few minutes he was back with the cheering information that the cases had been continued until July 31.

"Now you can all skin out and be sure to



MOTOR AGE

Pittsburg Automobile Club House

show up next Friday if necessary," said Jennings, beaming on his half dozen anxious-looking clients. And they all "skun" without further ado.

SPLendid CLUB HOUSE PLANNED

Pittsburg, Pa., July 27—The Pittsburgh Automobile Club has secured a lease on a desirable site in the east end, and by October 1 will have erected thereon one of the finest automobile club houses in the country. The site chosen is a triangular lot 52 by 74 by 74 feet, and it is situated in the heart of the automobile district. On the lot there now stands a one-story structure, which with very little remodeling can be made a model livery room. This will be used for storing members' cars exclusively. A charging current will be obtained from the market house near by. Three sides of this room are enclosed by heavy plate glass, making a splendid exhibition room.

To the present building the club will add another story, which will have the appearance of a roof garden, as it will be entirely enclosed with glass. On this floor will be an elaborate grill room, lounging room, kitchen, locker rooms and shower baths. Similar quarters are also to be provided for the lady members of the club. The rooms will be finished in hardwood and handsomely furnished with upholstered effects. In front of the building will be hung an electric club emblem, and tiny horns will be used in place of call bells in the grill and club rooms.

RAY IN NEW QUARTERS

The new factory of the Ray Automatic Machine Co., at Berea, O., is now complete, and as soon as the engine and shafting have been put in place the work of removing the machinery from the Cleveland factory will be commenced. New machinery is now being installed, and it is expected that by August 15 the removal will have been completed and the offices of the company will then follow.

CLEVELANDERS DISCUSS OUTCOME

Tradesmen in Ohio Center Agog Over the Infringement Announcement of the A. L. A. M.—Only Three Are Members

Cleveland, O., July 26—Cleveland daily papers of Sunday contained a large advertisement which served notice to manufacturers, importers, agents and users of gasoline automobiles that the manufacturers who have become members of the Association of Licensed Automobile Manufacturers propose to bring suit against infringers of the famous Selden patent and all other patents owned by the aforesaid members of the association. It was announced that no other manufacturers are authorized to make or sell gasoline automobiles and that any person making, selling or using such machines made by unlicensed manufacturers or importers will be liable to prosecution for infringement.

The announcement was the talk of the local trade today. The surprising feature is that only three of the fifteen or more manufacturers in Cleveland are included in the list of association members. Of course they are the largest concerns in the city in respect of the extent of their production, but there are several other Cleveland manufacturers who have gained considerable prominence in the American field. Just why they are not in the association is not obvious and is a matter of some conjecture.

PEERLESS TO STAY IN CLEVELAND

The future plans of the Peerless Motor Car Co. are still uncertain, but according to the statement of Sales Manager Kirkpatrick the company has about decided to stay in Cleveland, it being concluded that the advantages of being in the western hub of the industry, where all material can be obtained in the minimum amount of time and at the smallest amount of shipping costs, overweights the advantage of being in a small town where there is less liability of tie-ups caused by dissatisfied labor. With this in view it is probable that the Peerless company will remain in Cleveland and will build an addition adjoining the present factory. Then, if the business continues to develop as it has this year, it may be that a large factory will be erected on some other site.

AMERICAN MAY REORGANIZE

It is said to be quite probable that the American Motor Car Co., which was placed in the hands of a receiver a few weeks ago, will be reorganized by some of the old officials. George McKay, president of the company, who applied for the appointment of a receiver, is of the opinion that the business can be made a very prosperous one. The company spent nearly 2 years in perfecting its car and was producing a satisfactory machine which sold at a reasonable price. Plans were being made for largely increasing the output when the failure came. The difficulty was occasioned by a lack of capital just at a crucial time. Under the authority of the receiver, the material on hand is being assembled into complete cars as rapidly as possible and a good proportion of the machines have already been sold.

TWO NEW AIR-COOLERS

The Duquesne Motor Car Co., of Buffalo, has commenced the manufacture of a four-cylinder air-cooled machine, which will be tested during the coming week. If it proves as successful, as the builders hope and believe it will, work will commence at once to produce the machines

for the trade. The motors are of 14-horsepower, and the vehicle is of the touring car pattern, but is very light for the indicated horsepower, weighing less than 1,200 pounds.

The Regas Automobile Co., of Rochester, N. Y., has filed articles of incorporation at Albany, N. Y., and will commence the manufacture of automobiles as soon as possible. The capital stock of the new company is \$100,000, fully paid in. The officers of the company have not yet been selected, but this will be done at a meeting to be held this week. The automobile will have a two-cylinder, air-cooled motor, of from 12 to 15-horsepower, mounted in front. The size of the cylinders is 4 by 5 inches. The regular body will be of the runabout type, but will be so arranged that either a surrey or tonneau may be attached, as in the ordinary touring cars. It is expected to place the machines on the market at a popular price.

WOODRUFF ENLARGEMENT

The business of the Woodruff Automobile Co., of Akron, O., is increasing so rapidly that additional factory space is necessary. The company now occupies the north end of the old Empire plant, which is one of the largest factories in Akron, and has arranged to occupy a considerable portion of the balance of the building. New machinery will be installed, which will enable the company to more than double its output another season. The Woodruff company was recently reorganized with increased capital by Akron people and it is now said to be financially in shape to become quite an important factor in the trade.

PROPOSE COUNTRY CLUB HOUSE

The Dayton, O., Automobile Club is endeavoring to contrive some means to dispose of the money it made from the races on Decoration day. A proposition has been made by some of the members to place the money on interest as a starter for a fund with which to buy a club house later on, where the members may enjoy club life and have a place to store their machines when it is so desired, and to have a supply of things needful for motor cars and drivers. Others favor going to the country and establishing a country club, and this plan is well thought of by those members who also advocate the establishment of a city club first.

TREBERT RE-ORGANIZATION

The Trebert Engine Co. was organized at Rochester, N. Y., last week, and incorporated at Albany. The new company is the outgrowth of the old company of H. L. F. Trebert & Co., and the firm of Morris & Corkhill. The new company will make both water and air-cooled engines, and the transmission devices heretofore put out by the Trebert company. The combined business of the two old companies will be handled from a new and larger factory, which is now ready for occupancy.

OLDFIELD AND APPERSON AT ELKHART

Elkhart, Ind., July 21—The races last Saturday at Barney Driving park were witnessed by about 2,000 enthusiasts. The mile track was slow because of the heavy rain the night before, and the best mile made was in 1:04 by Barney Oldfield during one of the 5-mile races. In his exhibition mile, made on Tom Cooper's "999," his own machine being disabled, the time was 1:15.

The race between Oldfield and H. L. Cunningham, of Detroit, Mich., was two heats of 5 miles each. Cunningham made a poor show-

ing, finishing the first heat a half mile behind. The time in the first heat was 5:46½, and in the second, 5:40.

In the 5-mile race for 1,800-pound machines, Warren G. Hill, of Elkhart, won in 14:36; Elmer Apperson, of Kokomo, was second in 15:15, and Rudolph Kamm, of Mishawaka, third, in 16:16. Apperson later made the 5 miles in 9:46 in an exhibition run.

The 2-mile race was won by W. H. Barger, of South Bend, in 4:49.

SENATORS SCURRY FOR PERMITS

Washington, D. C., July 25—Now that the courts have decided that the automobile regulations framed some months ago by the district commissioners are reasonable and lawful, the city fathers have decided to put the regulations into effect 30 days from today. Commissioner West, who had supervision of the preparation of the regulations, has informed his associates that he is informed by the corporation counsel that in all the litigation concerning the new rules, the courts have upheld them.

Commissioner West has suggested that advertisements be published giving official notification that the regulations will go into effect within 30 days, and this suggestion will be carried out. This period of grace has been recommended because of the uncertainty which has attached to the formal promulgation of the new regulations and also for the purpose of giving time in which to register automobiles and take out permits for their operation. The necessary application blanks have been ready for some time.

RECENT INCORPORATIONS

Euclid Motor Co., of Pierre, Iowa., capital \$50,000.

The Limousine Co. of America, of Chicago; capital \$20,000. Incorporators: Louis Grollman, J. C. Gaffney and W. J. Evrard.

Rapid Transit Auto Co., of Buffalo; capital \$10,000. Incorporators, Chas. W. Roe, James M. Campbell and Arthur S. Hartsell.

Huber Automobile Co., of Detroit, Mich., capital \$100,000. Stockholders, Emil Huber, Edmund Sprung, Henri G. Ide, Alois Thuner, Marsden C. Burch.

Buffalo Rubber Mfg. Co., of Buffalo, N. Y.; capital \$50,000. Directors, Augustus J. Commins, Akron, Ohio, and Elias L. Toy and Percival M. Mute, of Buffalo.

Cluts Mfg. Co., of Cuba, Ill., capital \$25,000. Incorporators, Oliver Cluts, G. H. Day and O. R. Grady. The company will manufacture automobiles, using the improved steering gear invented by Oliver Cluts.

World's Fair Automobile Transit Co., of St. Louis, Mo. Capital stock, \$600,000. To manufacture and operate automobiles to convey passengers, mail and express matter. Stockholders, Thomas J. Hoolan, Charles M. Polk, T. J. Flanagan, Lawrence W. Day, Spence L. Finley, A. L. V. Mueller, James C. Espy, James AxteLL, Michael Hurst, Charles Vastine and H. E. Simon.

SACKETT WITH SEARCHMONT

L. J. Sackett, who has been with the Limousine Co. of America as salesman, has recently taken to a similar position with the Searchmont Automobile Co., of Philadelphia, Pa., and will shortly make a trip to the Pacific coast selling Searchmonts. Mr. Sackett was one of the first gasoline vehicle salesmen in this country, his first experience being with the Orient tricycles and quadricycles.

THE READERS' CLEARING HOUSE

CAUSE OF SIDE SLIPPING

Baltimore, Md.—Editor MOTOR AGE—Having read a letter in the Readers' Clearing House, from W. P. S. of Salem, Mass., stating that side slipping or skidding is due to the steering wheels being in the front instead of the rear of the car as he suggests, I would like to take issue with him on this point. Side slipping or skidding is due to an entirely different cause. To illustrate this experimentally, take a bicycle wheel complete with tire and spindle, and while holding the wheel by the ends of the spindle, have another person rotate the wheel as rapidly as possible. Then move the wheel backward and forward in the plane of its revolution. This can be done with scarcely any effort. Now try to move the wheel in one direction or the other at an angle to the plane of its revolution and the wheel will be found to offer a powerful resistance to any effort made to divert it in this manner. It will make no difference whether one end of the spindle is moved to or from the operator or up and down. The wheel will offer resistance to any movement, except a horizontal or vertical one in the plane of its revolution. This resistance to turning is due to the gyroscopic action set up in the wheel and it is to this action that the side slipping or skidding of the wheels of an automobile is due, and is more noticeable in the front than the rear wheels, from the fact the front wheels practically turn on a pivot, while the rear wheels make the turn in an arc of a circle. The fly wheel of a gasoline motor being of much greater weight than the wheels of the car, will possess this gyroscopic action to a much greater degree than the car wheels, especially when the plane of revolution of the fly wheel is parallel with the direction of the travel of the car, as is usual with nearly all cars having horizontal cylinder motors.—H. J. R.

SECONDARY ARCING PHENOMENON

Washington, D. C.—Editor MOTOR AGE—I notice in the Readers' Clearing House, in MOTOR AGE of July 23, relative to the arcing of the second current, that in the original proposition the sparks jumped across the spaces between the seventeen pieces of wire all at once. I think that this must be a mistake, as the sparks no doubt appear to jump all at once, but in reality the secondary current flows through the pieces of wire successively, the second pieces being energized from the first, the third from the second and so on; the passage of the current across the gaps being so quick as to deceive the eye.—H. C. C.

For commercial and scientific purposes an electric current is arbitrarily assumed to have a flow or a direction of travel from one pole to the other. This is based on the fact that if a primary battery be working on a closed circuit, bubbles of hydrogen pass from the negative to the positive plate. In reality no such thing takes place as a flow of current in one direction or the other, but a return of the electric ions to a natural state of neutralization is effected upon the closing of the electrical circuit; or, as in the case of the secondary current, upon reducing the resistance of the external or air circuit until the neutralization

of the ions is effected between the ends of the secondary wires. The fact that the secondary current will jump across the sixteen gaps, is due to the fact that the introduction of the copper wire seems to lessen the resistance of the path of the current through the circuit. An experiment was recently tried to demonstrate this point, by substituting seventeen pieces of German silver wire for the copper wire, using wire of the same gauge. The spark would only arc through four or five air gaps each 1-16 of an inch long, a French type of vibrator coil giving 450 vibrations per second and a three-cell storage battery being used to conduct the experiment. German silver wire has approximately twelve times the resistance of copper wire, while air, of course, has many times the resistance of copper wire.

INLET VALVE OPENINGS

Syracuse, N. Y.—Editor MOTOR AGE—What should be the correct diameter for the inlet valve opening of a motor of 4-inch bore and stroke, with a speed of 1,125 revolutions per minute; also for a motor of 4½-inch bore and stroke at 1,000 revolutions per minute?—B. C.

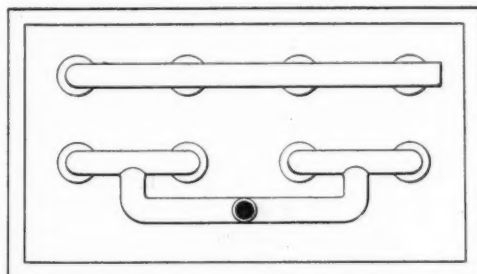
The correct diameter of the inlet valve opening for a motor of 4-inch bore and stroke at 1,125 revolutions per minute is 15-16 inches; and for a motor of 4½-inch bore and stroke at 1,000 revolutions per minute, 1½ inches.

PLUMBAGO FOR LUBRICATION

St. Louis, Mo.—Editor MOTOR AGE—Upon reading the article entitled Starting Heated Motor in MOTOR AGE of July 23, I was reminded of a recent experience with plumbago as a cylinder lubricant. It was very properly recommended that graphite should be used for the purpose of lubricating the inlet valve stem, but it was neglected to caution the user against the dire consequences of permitting the plumbago to enter the compression chamber.

There is no doubt that graphite is a first-class lubricant for steam-cylinders, also gas engine cylinders, if electrical ignition is not used. Good results were obtained on gas engines ignited by hot tube, but as for using graphite in the crank chamber or cylinder of an electrically ignited engine—don't.

For the benefit of "suffering" automobile humanity, I give the following account of my



MOTOR AGE

Inlet Pipe Arrangement

experiments with graphite as a cylinder lubricant in gasoline motors:

I placed one ounce of flake graphite in the crank chamber of my double-cylinder, electrically ignited automobile motor, thinking thereby to prevent the wear which high-test

oil had not obviated. The result was surprising in the extreme. The engine ran only a few moments and then stopped. After removing the spark points I found them thickly coated with graphite. In other words, the graphite had gotten into the cylinders and short circuited the current, preventing a spark from being formed. It lodged between the points and formed a thorough conductor. The result was the same upon both jump and wipe spark apparatus.

It is needless to say that I shall never again attempt to lubricate such parts by means of graphite. However, graphite is an efficient lubricant for steam-engine cylinders as well as for the exterior bearings of engines of every sort, but under no circumstances should it be used in such manner that it can come in contact with the spark points of a gas engine.—JOHN C. HIGDON.

CARBURETER FOR HIGH SPEED

Cleveland, O.—Editor MOTOR AGE—My gasoline runabout is equipped with a horizontal, single-cylinder motor of 6 horsepower, with a mixing valve form of carbureter. The motor is claimed to be capable of speeds from 100 to 1,000 revolutions per minute, but so far, I have not been able to get more than about 650 revolutions per minute out the motor. A friend of mine who is quite an authority on gasoline automobile motors informs me that a mixing valve is not suitable for a speed of over 700 revolutions per minute. Will you inform me if this information is correct and also what is the best type of carbureter to use? The inlet pipe of the motor is of 1½-inch pipe size.—F. G.

The information given is correct, a mixing valve is hardly suitable for a speed of over 750 revolutions per minute. A float feed carbureter should be used if a higher speed than 750 revolutions per minute is desired.

ARRANGEMENT OF INLET PIPES

St. Paul, Minn.—Editor MOTOR AGE—I have a four-cylinder gasoline motor whose inlet valve openings are connected to the carbureter by a single pipe, as shown in the accompanying sketch. The first and second cylinders; that is, the two next to the carbureter, work well, but the third cylinder mis-fires occasionally and the fourth cylinder only fires once in a while. Can you suggest any other arrangement of piping to the inlet valve openings which will remedy this trouble?—S. F.

The arrangement of piping shown in the upper view in the drawing is a very poor form of connection to the inlet valve openings and is the cause of the trouble stated by the writer. The lower view in the drawing shows the correct method of piping, to the inlet valve openings from a single carbureter, so that the distance the fuel must travel to reach each cylinder will be the same.

SECURING WRIST PIN

Milwaukee, Wis.—Editor MOTOR AGE—The wrist pin in the piston of my gasoline motor has been a constant source of trouble to me, since I first got the car. The wrist pin has a threaded shoulder on one end, which screws into one of the hubs in the piston. No matter how tightly I screw up wrist pin into place it is constantly loosening, and has scratched the cylinder badly. I tried putting a set screw in the hub in which the straight part of the wrist pin fits, but the metal is so thin that I could only get three or four threads in the

hole, and when I tightened up the set screw the threads were stripped. As I am going to have the cylinder rebored I would like to have some way suggested by which I can secure the wrist pin in place and prevent it again coming out.—M. S.

The wrist pin can be securely held in place by drilling and tapping a hole through the hub which carries the straight part of the wrist pin and about $\frac{3}{8}$ of an inch down into the wrist pin. By screwing a set screw into this hole the wrist pin will be firmly secured in position.

SPEED LIMIT FOR FULL CHARGE

Jersey City, N. J.—Editor MOTOR AGE—I have a gasoline automobile motor of 5-inch bore and stroke, with the inlet valve opening $1\frac{1}{2}$ inches in diameter, and would like to know what would be the maximum speed of the motor at which it would draw in a full charge of mixture?—T. V.

The maximum speed at which a motor of 5-inch bore and stroke will draw in a full charge of mixture is about 750 revolutions per minute. This is based on the assumption that the inlet valve is mechanically operated. If the inlet valve is atmospherically or suction operated it will at no time allow a theoretically full charge to be drawn into the cylinder, on account of the partial vacuum formed, due to the resistance of the inlet valve spring.

INLET VALVE IN TWO-CYCLE MOTOR

Glenwood, Ill.—Editor MOTOR AGE—In MOTOR AGE of July 16, A. F. D. of Columbus, O., asks regarding a two-cycle motor with the inlet valve in the head of the piston. The two-cycle motor appeals to users of gasoline motors on account of its simplicity. A two-cycle motor gets very hot when in use and defective valves make a poor working motor. Valves complicate a motor and without them, it is only necessary to use a high fire test lubricating oil to insure good results. Fit the spark plug in a chamber with a compression release cock attached, above the combustion chamber. It will keep much cooler in this position and it will only be necessary to open the cock occasionally to keep the plug clean and free from soot and oil.—J. A. H.

IMPROPERLY SHAPED CAMS

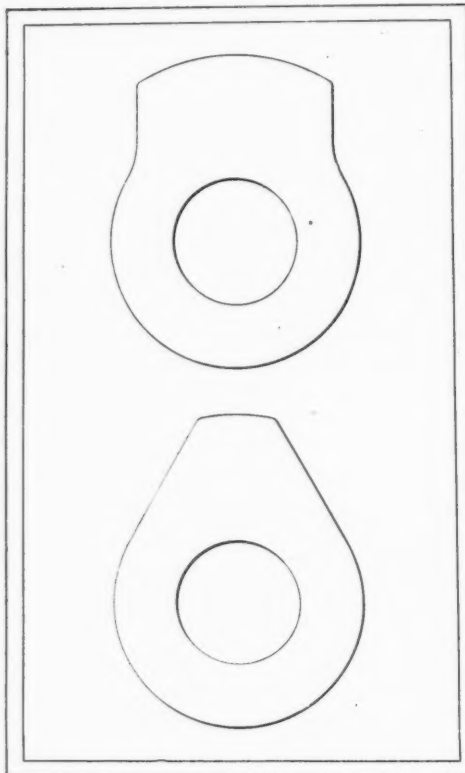
Pittsburg, Pa.—Editor MOTOR AGE—Some weeks ago a new gasoline touring car, which I had ordered several months before, was delivered to me by the local agent. It was supposed to be in running order, and was said to have been thoroughly tested both by the manufacturers and the local agent. The car was rated at 10 horsepower and weighed about 1,700 pounds, with gasoline and water tanks filled. The local agent accompanied me on my first few trips in the car, which, while seeming to run all right, did not develop the power that I anticipated it would have.

The car stalled several times on bad roads and would not take a light grade on the second speed. The local agent explained away these difficulties by saying that as the car was new the motor and the rest of the machinery was stiff and all that would be necessary to get rid of these troubles was to keep on running the car until it was thoroughly limbered up.

A week went by and still the car did not improve in hill climbing ability or speediness. The local agent was interviewed regarding the

matter, and after taking another trip in the car with me still insisted that his former statement was correct, and that all the car needed to get it into shape was a little more running.

Shortly after this I received an invitation to visit friends in Chicago and to spend a month or two with them at their summer home. The car was accordingly shipped to that city and reached there a few days after my arrival in the Windy City. Thinking that a change of climate might have benefited the car, it was taken out for a spin as soon as it was unloaded from the train. The car seemed to act worse than before, and stopped half way up one of Chicago's numerous viaducts and refused to go further. A bystander was asked the location of the nearest repair shop or automobile station. He advised us to go across the street and telephone a certain repairer to send



MOTOR AGE

Comparative Cam Shapes

an ambulance car to take our machine to his shop to be fixed. He was recommended as being able to make anything run that has wheels under it. This was done and in about 10 minutes a dilapidated looking automobile came dashing up with the speed of a street railway wrecking or patrol wagon, and almost before I was aware I was on my way to the repair shop, bumping along over street car tracks and swinging around street corners at a speed that the car had never before attained when under its own power.

Upon arriving at the repair shop, the motive power was disconnected and the car pushed upon a hand power elevator and taken to the second floor. The car was then run off the elevator on to the floor of the shop. The motor was started and run light for about ten minutes, when the proprietor of the shop suddenly swore in none too mild terms and pushed the car to a part of the shop where a block and tackle, on an overhead traveler, was located. The bonnet was quickly detached from the car, and a sling put around the motor, which was then hoisted out of the front of the car.

After the lower half of the crank chamber was removed, which was impossible while the motor was in place, a brief inspection and test

showed that the exhaust valve lifters had too long a dwell upon the exhaust valve cams and that while the exhaust valves commenced to lift about $\frac{3}{8}$ of an inch before the end of the explosion stroke, they did not seat until the piston was almost one-fourth of the way down on the suction or intake stroke of the motor.

The cam shaft was then removed from the crank case. The accompanying sketch shows the shape of the cams as they were before and after fixing.

The exhaust valve cams were removed from the shaft and a templet made for the correct shape, to which they were filed by a competent mechanic. After the cams were replaced on the cam shaft and the motor put back in the car, it ran itself upon the elevator, out into the street and up one of Chicago's boulevards at a rate of speed far above the limit. That was the end of the trouble and the car now runs delightfully.—H. G.

EXPERIENCE WITH BELT DRIVE

Akron, O.—Editor MOTOR AGE—I have been running an automobile of my own make for the last 5 years and have had quite a varied experience during that time. I have noticed from time to time in the Readers' Clearing House questions and answers on different subjects with which I have experimented. One of the subjects was with regard to the use of belts for an automobile drive. I used for 3 years on my automobile a leather belt $2\frac{1}{2}$ inches wide, running on an 8-inch pulley on the crank shaft. The motor was of 5-inch bore and 6-inch stroke. After a thorough stretching the belt was made endless and never again required taking up. The belt was of the best quality single ply leather. Another query which I frequently see in the Readers' Clearing House is with regard to increasing the compression in the combustion chamber of a gasoline motor. It does not seem to me to be the proper way to increase the compression by attaching a piece of metal to the head of the piston, as I am in favor of making all the reciprocating parts as light as possible. In my motor the wrist pin and crank pin bearings are made with internally threaded hubs, with right and left-hand threads, 13-16-inch in diameter and 12 threads per inch. The connecting rod proper is made of steel with threads at each end to correspond to those of the wrist and crank pin bearings. By this method I have a connecting rod which I can adjust to almost any desired degree of compression in a few minutes, without adding any weight or making any changes in the motor. I use a make and break primary spark for the ignition, with German silver contacts, 3-16 of an inch in diameter, and have it so arranged that I can adjust the timing from the seat of the car. It works very nicely, in fact I have not removed the plug from the cylinder for over three months, although I am running the car every day.—G. G. C.

DID NOT LIKE THE NOISE

Chicago, Ill.—Editor MOTOR AGE—Some few evenings ago, while out in my gasoline runabout on one of the south side boulevards, I saw a crowd gathered round a large touring car, which was the object of their curiosity. The owner, who was also the operator of the car at this time, was at his wits' end as to what next to examine, to find out why the car refused to go. I asked him what the trouble was and he replied that he did not

know, as everything seemed to be all right; batteries in good shape, spark plugs new and clean, gasoline of the best grade, and plenty of it.

Thinking that there might be a break in the wiring of the car or a short circuit somewhere, I requested him to turn the motor over until the battery circuit was closed by the commutator, so that the spark plugs could be tested. Just as soon as the contact was made one of the spark plugs gave a feeble spark about every two or three seconds, and when the motor was turned over until the other plug was in the circuit, the same thing was noticed. An examination of the induction coil which was of the duplex dash board type, showed that the vibrators were working feebly.

The contact screws were adjusted until the vibrators were pitched to the proper note, a matter which it is rather difficult to explain, but must be ascertained from the result of experiment. After cranking the motor, it started at once and no further trouble was experienced. Upon asking the owner of the car, how the vibrators had got out of adjustment, he very sheepishly replied: "I did it, as I did not like that funny buzzing noise, it sounded like a bumble bee in a tomato can and made me nervous; and besides I thought that the coils would use more current when the vibrators were working so fast." Upon being informed that this was contrary to the actual state of affairs and that the coils would not only give better results, but use less current when operating at a high rate of speed, he was exceedingly grateful and went on his way rejoicing.—E. B.

MAKE AND BREAK SPARK AND SPEED

Louisville, Ky.—Editor MOTOR AGE—Can a primary make and break form of spark in the combustion chamber of a gasoline motor be used for a high speed motor, in place of a secondary or jump spark? I have a two-cylinder motor with a primary make and break spark mechanism, which is claimed to be capable of running up to 1,500 revolutions per minute, but with the batteries which came with the motor—consisting of six dry cells—I have not been able to get over 700 revolutions per minute out of the motor. Thinking that the dry batteries did not furnish current enough, I tried a three-cell storage battery. The make and break is spring operated and is brought into contact by means of a spring steel lifter, located outside the combustion chamber, which holds the contact points within the combustion chamber together, and then releases them by dropping suddenly off the nose of a cam. The spring attached to the movable electrode then makes the sudden break between the points to produce the primary spark. When turning the motor over slowly by hand, such a volume of current from the storage battery passed between the contact points that it fused them together, and the spring was consequently unable to separate them and no spark was produced.

I then arranged the storage and dry batteries with a switch so that I could start the motor with the dry batteries and afterwards change to the storage batteries while running. The storage batteries made quite a little increase in the speed of the motor, but the contact points became corroded and eaten away far more rapidly than when the dry cells were used. The contact points of the make and break are of German silver, $\frac{1}{8}$ of an inch in diameter, and under ordinary conditions of

usage will last about 6 months. Can you suggest any change in or addition to the ignition mechanism which will make the motor run up to its rated speed of 1,500 revolutions per minute?—F. K.

To use a make and break primary spark mechanism for a speed of 1,500 revolutions per minute, the contacts would have to be of tool steel, without German silver points, but water hardened on the ends which go into the combustion chamber. A shunt wound generator with a capacity of 25 volts and 5 amperes will be necessary to furnish the current for ignition purposes and a plain spark coil with a resistance of about 1 ohm. It is not possible to attain the same results with either dry or storage batteries with a make and break form of primary spark, as when the motor is run slowly, the length of time the electrical circuit is closed and consequently the time of contact at points of the make and break in the combustion chamber is increased and an enormous amount of current would flow on account of the extremely high voltage which is necessary for the rate of speed required. The shunt wound generator is self regulating and within its working limits will at all times keep the voltage and current constant.

RE-FITTING PISTON RINGS

Jackson, Mich.—Editor MOTOR AGE—The cylinder of my $4\frac{1}{2}$ -horsepower motor having become badly worn and somewhat scratched, I had a new set of piston rings made; but instead of improving matters the new piston rings seem to have made things worse, and motor has scarcely any compression at all. Can you give me any help in this matter?—C. R.

Fitting new piston rings to a worn cylinder would certainly make matters worse, as the old rings had worn to the shape of the cylinder. The cylinder should be rebored and a set of piston rings made to fit the new bore.

FRICITION DRIVE ROLLER

Tampa, Fla.—Editor MOTOR AGE—Will you inform me of some material which can be used in place of cast iron for the face of the roller of a friction driven gasoline automobile? It is exceedingly noisy and slips a great deal, especially in wet or muddy weather.—J. K.

Friction board, which is made especially for this purpose, can be obtained from any large millwrighting concern. It will, however, require a grooved roller of special construction with one loose flange to clamp the friction board in place. The better plan would be to order a roller of the proper diameter and width of face from some millwrighting concern.

TESTING IGNITION BATTERIES

Hartford, Conn.—Editor MOTOR AGE—Which is the proper instrument to use for testing batteries, a volt meter or an ampere meter? I have been told that it will injure an ampere meter if it is put in a battery circuit.—E. C.

A pocket ampere meter should be used for testing dry batteries, as a dry battery will show up almost its full voltage and still be practically exhausted. Storage batteries should always be tested with a small volt meter; using an ampere meter in the circuit will not in the least injure the ampere meter, but it is bad practice to put a storage battery on a short circuit even for an indefinitely short length of time. An ampere meter is made to measure the strength of an electric current and if used within the limit of its rated capacity, no harm

can be done it by leaving it in an electrical circuit indefinitely, as is the case when charging storage batteries.

TRANSMISSION GEAR SIZES

Kansas City, Mo.—Editor MOTOR AGE—What should be the width of face and diametral pitch for the gears of a sliding gear transmission to transmit 15-horse power? Also which are the best materials to use for the same?—F. B.

For a sliding gear transmission to transmit 15-horse power, the face of the gears should be $1\frac{1}{4}$ inches and the diametral pitch No. 5. The gears should be of phosphor bronze and the pinions of cast or wrought steel.

RADIATOR FAN SPECIFICATIONS

Cleveland, O.—Editor MOTOR AGE—What is the correct pitch for the blades of a fan, 15 inches in diameter, to use in connection with a combination tank and radiator of the Mercedes type? The fan will have six blades, 3 inches wide, and will run at a speed of 1,800 revolutions per minute. Also about what horsepower will be required to operate the fan, and what will be the velocity of the air in feet per minute?—M. Y.

The outer edges of the fan blade should be at an angle of 45 degrees and gradually curve over until the ends of the blades next to the hub are parallel to the plane of rotation of the fan, or at right angles to the fan shaft. Such a fan will require about 1-6 of a horsepower to be run at 1,800 revolutions per minute. The velocity of the air would be about 2,000 feet a minute.

CHARGING SMALL STORAGE CELLS

Clinton, Ia.—Editor MOTOR AGE—Can gravity batteries be used to recharge a small two-cell storage battery, and if so, how many cells should be used for the purpose? I am a telegraph operator and have access to an almost unlimited number of gravity cells, so would like to use them if possible.—P. H.

Gravity cells can be used to charge a small two-cell storage battery with good results. From eight to ten cells will be necessary to effect a proper charging.

FULL CHARGE OF FUEL

Memphis, Tenn.—Editor MOTOR AGE—I have a float feed carburetor of French make fitted to my 10-horsepower, two-cylinder motor, and if I try to run the motor with the throttle in the inlet pipe full open, the motor will either stop altogether or not develop as much power as it does with the throttle about three-quarters of the way open. There is no way to regulate the quantity of gasoline fed to the nozzle of the carburetor. The nozzle has a small hole in it about 1-32 of an inch diameter. What is the cause of this trouble and can you suggest any remedy for it?—W. F.

The probable cause of the trouble must be in the fact that the hole in the nozzle does not supply the quantity of gasoline which is necessary when a full supply of air is taken into the carburetor, to produce a highly explosive mixture; thereby causing weak explosives or mis-firing when the throttle is full open. The nozzle should be removed from the carburetor and the hole drilled larger. A little experimenting may be necessary to get the right size of hole as it is not good policy to enlarge the hole too much the first time. Use a size larger drill than the one originally used in

the hole, then replace the nozzle and test the motor. If this be not sufficient repeat the operation.

JAW STEERING KNUCKLES

NEW YORK—Editor MOTOR AGE—A recent editorial, appearing in one of the technical automobile journals, on the subject of steering knuckles is somewhat misleading in the general impression which it leaves with the reader, which is to the effect that the jaw type has been found to be generally unsatisfactory and is being abandoned for the so-called French type.

It is the purpose of this article to show that there are two sides to this question, and that not only has the jaw type not lost standing among automobile manufacturers, but that as a matter of fact it is gaining strength.

The relative advantages of this feature of automobile construction should be looked at from three points—general design, adaptability to various uses and in the light of the survival of the fittest.

Taking up the first head, general design, it could be mathematically proven that for a given weight of metal the jaw type is stronger to resist the bending strains of the load than the French type. The jaw type also enables the designer to get the spring down lower so as to pull more nearly at the center of the wheel, thereby reducing twisting strains on the spring. It can be said, of course, that with the French type the axle can be dropped as low as desired, which is very true; but this necessitates a more expensive forging and more weight.

On the score of cheapness, by examination of the number of square inches of surface to be machined and the amount of metal to be removed it will be found that it is less in the jaw type than in the French type, and that some of the machining operations are more easily accomplished, as well.

The strongest argument which the advocates of the French type advance is that of lubrication, and on this score alone they have fairly good ground on which to stand so far as the supplying of lubrication to the wearing surface is concerned. That, however, is not the only phase of the question to be considered, as square inches of bearing surface must also be taken into account. In the French type the vertical portion of the spindle must be of sufficient diameter to stand the bending strains of the load, and this vertical spindle goes up through the axle end. In the jaw type the vertical member is in tension only and is made of comparatively small diameter. This means that for a given outside diameter of axle head the jaw type allows the designer to obtain a very much larger bearing surface to carry the load, which in turn means that a less perfect system of lubrication is permissible.

It is further stated that the French type is capable of adjustment, where the other is not, which statement is also on the face of it true. However, experience covering a great many years of service with axles of the jaw type proves conclusively that where sufficient bearing surface is provided this type of construction permits the use of a large surface—the wear is inappreciable. Nevertheless, provision can readily be made to take up wear as desired by the introduction of two or three hardened, loose washers at the bearing surface.

On the score of general appearance we believe there is no question that the jaw type gives a more compact, neater and better balanced appearance than the French type.

Under the second heading of adaptability to

various uses, it is usually stated that the attachment of the steering arm to the wheel pivot is more easily accomplished in the French type than in the jaw type. This is open to question, however, as a general proposition, and in a great many instances the reverse is actually the case. The advocates of the French type will certainly admit that it is as a general proposition impractical to attach a steering arm to the top of the pivot where it comes through the axle end, leaving, therefore, only the lower end available for this attachment. This brings the steering arm below the center of the wheel and necessitates the steering parts on body of the vehicle being carried down very low. In the case of the jaw type the steering arm can be attached to the upper end of the vertical portion of the pivot, in which case it comes above the axle and nearer the body.

Viewed in the light of the survival of the fittest, it is by no means safe to say yet, of course, that the ultimate construction of any part of the automobile has been reached, although it is perfectly permissible, eliminating freaks and freak constructions, to conclude that the general tendency is toward the ultimate construction.

Taking the foreign situation, the tendency in construction instead of being toward the French type is, as a matter of fact, away from it, as is evidenced by the abandoning of this type of construction by the Mors and Panhard companies in the latest vehicles. The latest Gladiator and Clement cars also have the jaw type. The light vehicles built by the Milnes company, Georges Richard, and the Darraq company do not include the French type. The well known and eminently successful Renault has never used anything but the jaw type. One of the latest cars to appear in the European market, manufactured by the Krupp company at Essen, also uses the jaw type. In England the Woolsey car, as well as a majority of the others, use the jaw type. The Napier commercial cars have up to the present time used the French type, but on the racing car of last year and of this year it has been abandoned in favor of the jaw type, as the Panhard people have done this year on their racing cars.—READER.

DISPLACER PISTON ENGINE

Indianapolis, Ind.—Editor MOTOR AGE—Referring to the article on cylinder head gasoline admission by A. F. D., the writer has built a motor of this type. Seven years of actual experiment along this line leads me to believe

that this is the only true principle of gasoline admission in a two-cycle motor, although considerable trouble was, however, experienced in obtaining the desired crank case displacement.

My first engine was constructed steam engine fashion, in which the gasoline and air were fed from one end to the other through an $\frac{1}{2}$ -inch pipe and check valve. The cylinder bore was $3\frac{1}{2}$ inches by $2\frac{1}{2}$ inches stroke.

It can be readily understood that an absolutely clean mixture is brought to the explosive end of cylinder and that ignition is certain. The vacuum created in the ordinary take-in on two-cycle engines is obviated, owing to the fact that on the downward stroke of the piston, when the mixture is drawn in, the action is the same as that of the four-cycle motor. It seems to me that in all engines of this class now constructed, taking the mixture in at the point of exhaust is not correct, and necessarily leaves a quantity of burned gases in the cylinder, which, on being compressed, forms a layer above that of the fresh charge, causing the ignition to become more or less intermediate and forcing a number of unburned charges into the atmosphere, thus giving the undesirable odors often consequent to this class of motors.

I will later give further results pertaining to experiments along this line. The accompanying drawing shows the construction of my third engine.—CHAS. J. GUNTHER.

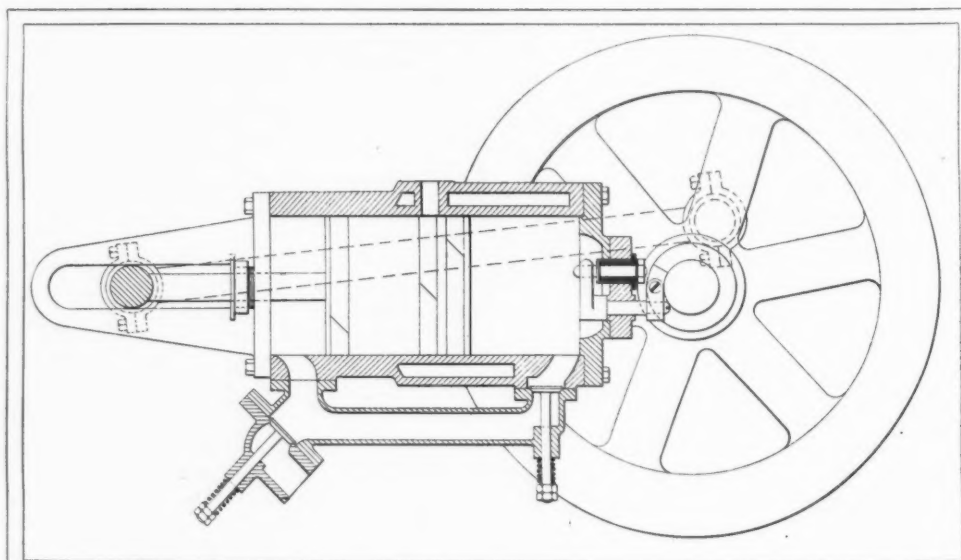
FLASH AND WATER TUBE BOILERS

Wichita, Kan.—Editor MOTOR AGE—I would like to obtain from some of the members of the Readers' Clearing House an unbiased opinion—based on experience—as to the comparative merits of the flash type of steam boiler and the ordinary water tube steam boiler as used for automobile purposes.—G. W. M.

WILL START AGAIN

R. A. Kent, who started from Chicago to New York in a Cadillac a few days ago to make a test of the B-ok tires, was compelled to return to Chicago on the second day of his trip on account of illness. He made a second start Wednesday of this week.

There being a widespread desire for match races in connection with open race meetings, it might be well for some promoter to bring Messrs. Percy Owens and L. P. Mooers together this summer. The pair would probably provide a close and altogether interesting race.



MOTOR AGE

Mr. Gunther's Two-Cycle Motor

IN THE FIELD OF AUTOMOBILE DEVELOPMENT

JENATZY ELECTRO-MAGNETIC CLUTCH

Numerous attempts have been made to utilize the tractive properties of an electro-magnet as a means or form of flexible transmission between the motor and the road wheels of a gasoline car. M. Jenatzy, the designer of the Jenatzy-Martini car, built at Liege, Belgium, has recently introduced a practical form of electro-magnetic clutch, which overcomes railway difficulties encountered by former designers, and which is of simple construction and of enormous tractive power.

In the illustration the fly wheel A is shown bolted to a flange on the end of the crank shaft B. The rim of the fly wheel has an annular groove which carries the field coil D, the electrical energization of which causes the fly wheel to become a powerful electro-magnet.

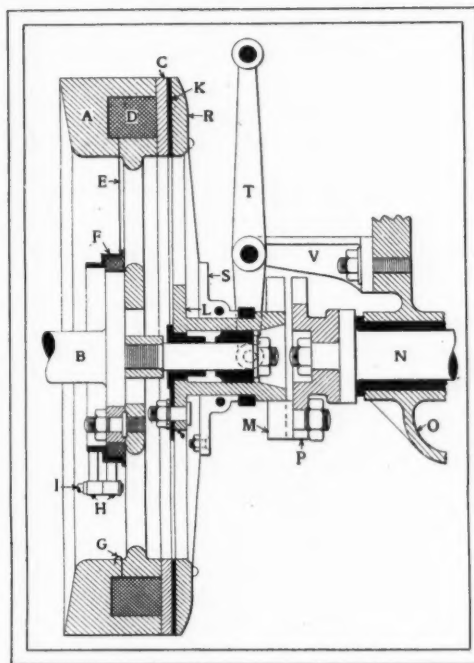
The fly wheel A is made of cast steel instead of being of the usual cast iron construction, on account of the greater magnetic properties of cast steel. A ring C, of non-magnetic metal, is secured to the face of the fly wheel, over the field coil D. This ring has slots cut through its face at intervals, which are filled with blocks of anti-friction metal. One end of the field coil D is connected by a wire E to the contact rings F, which are insulated from the fly wheel, but revolve with it. The other end of the field coil D is grounded to the rim of the fly wheel at G.

The electrical current which flows in the windings of the field coil D, and induces lines of force or magnetic flux in the rim of the fly wheel A, is led to the field coil D through two brushes H, which are in electrical connection with the storage battery or dynamo by means of the insulated pin I, attached to the crank chamber of the motor. Two brushes are used so as at all times to ensure a good electrical connection with the contact rings.

A thin wrought iron disk K is fixed to a sleeve L, which revolves freely upon a stud carried by the fly wheel A. The sleeve L is free to move a certain distance longitudinally, and therefore the disk K can be brought into contact with C, or moved away from it. The sleeve L has a flexible coupling member M by means of which it is connected with the driving shaft N of the gear case Q, through the other flexible coupling member P.

A steel ring R, lies outside and alongside the disk K. It is carried by a split sleeve S, which is carried by and revolves freely upon the sleeve L. The ring R forms the armature of the electro-magnet, through which the path or circuit of the lines of force or magnetic flux is completed, and is caused to grip the disk K, between itself and the ring C, by the magnetic effect of the rim of the fly wheel A, when the electrical circuit is closed through the field coil D. It should be noted that the ring R is mounted freely on the sleeve L, and has no rigid connections with either the driving or driven members of the clutch.

Although the clutch members are drawn together magnetically and the power exerted can be varied, a pedal is also mechanically connected to the sliding sleeve L, so that the disk K, and the ring R may be moved out of contact with the ring C, by depressing the pedal. This mechanical connection is similar to that usually employed for operating an ordinary fly wheel, cone friction clutch, the pedal being connected to the lever T, which is pivoted to the bracket V, and engages at its



MOTOR AGE

The Jenatzy Clutch

lower end, by means of a yoke, the sleeve L. As the pedal is depressed by the foot, the degree of magnetism, which holds the clutch members together is gradually reduced and finally the sleeve L, is moved away from the fly wheel and finally separates the clutch members.

The electric current on its way to the brushes H, and thence to the field coil D, is led through a variable resistance device, which is mounted in front of the dash, beneath the motor bonnet. This apparatus consists of a six-pronged switch drum, the stationary contact pieces of which are connected with fine wire resistances contained in the base of the device. The switch drum is connected with the clutch pedal by means of a rod, so that as the pedal is pressed down, the switch drum rotates about its axis, gradually cutting more and more resistance into the circuit, by the moving of the contact arms away from their stationary contacts. There are six arms and six contacts, so that the amount of current passing through the field coil of the clutch is reduced in six stages. The lines of force or magnetic flux in the magnetic circuit pass through the ring R and the force exerted in holding the disk K and the ring R to the fly wheel is enormous, although a current of only half an ampere, with an electromotive

force of 16 volts is all that is required to properly operate the clutch.

The principal advantages in the use of an electro-magnetic clutch may be enumerated as follows: That the car may be started gradually and without jar or shock; that very slight foot pressure is required on the clutch operating pedal; that the momentum of the revolving parts, which are connected with the gear shaft N, is unusually small, owing to the fact that the only clutch member which is rigid with the shaft N is the disk K. This feature renders the manipulation of the change-speed gear extremely easy, and further, tends to increase the duration of the life of the change speed gear considerably.

The electrical apparatus consists of a battery of eight cells—the capacity of which is 30 ampere-hours—and a special dynamo which can be used for recharging the storage batteries or supplying the current directly to the clutch. The dynamo is wound to give 24 volts, and not only supplies sufficient current for the clutch and the ignition apparatus, but is used for operating the car lamps. A small switch is located on the dash to enable the batteries to be brought into operation alone; to connect the dynamo so as to work in parallel with the storage batteries and thus charge them, and to connect the dynamo so as to supply the different electrical appliances without the assistance of the storage batteries.

GAS ENGINE DESIGN

A new edition of Gas Engine Design, by E. J. Burton, Hodges building, Detroit, Mich. The Stoddard, has just been issued by Parker & book covers the theory of gas engine mathematics in as simple and brief a manner as possible, including a diagram for obtaining without calculation the pressure and volume of the charge during compression, the maximum explosion pressure and the theoretical indicator diagram. There are also chapters on gasoline and air mixtures, valves and springs, strength and proportion of parts and the theory of the sparking or coil. As a work of reference, as well as study in gas engine theory and practice, the book is valuable. The cloth bound edition sells for \$1 and the paper bound edition for 25 cents a copy.

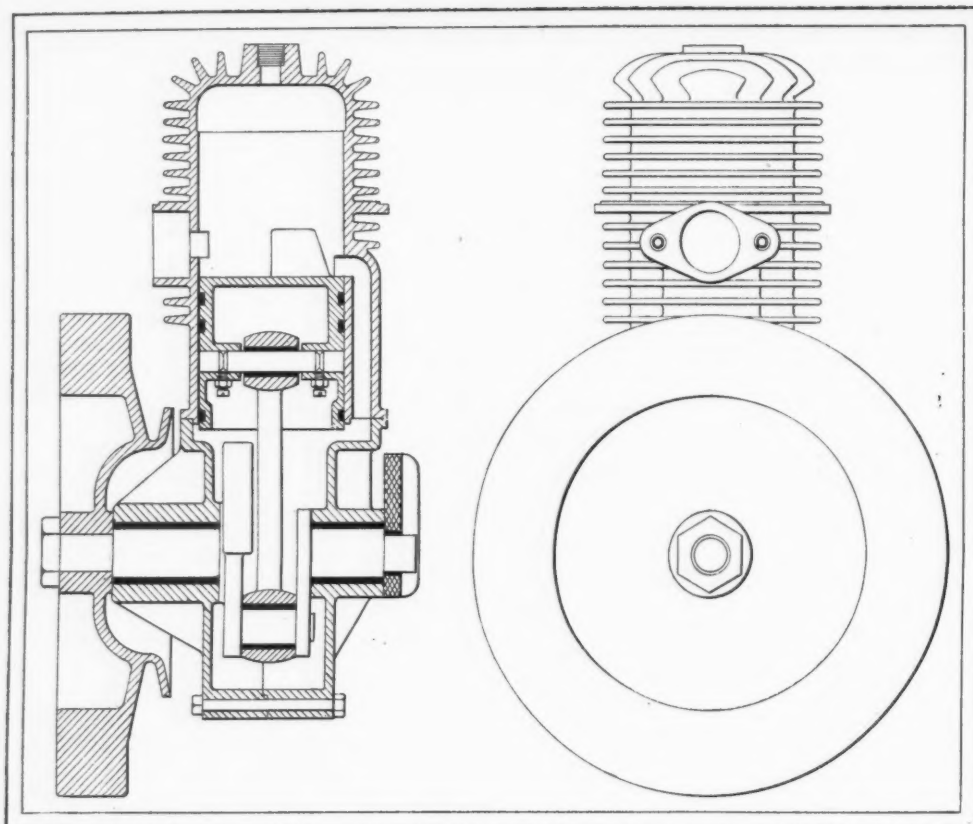
POWER FOR GRADE CLIMBING

The accompanying tables gives the approximate horsepower required to climb grades of from 5 to 20 per cent, at speeds of from 6 to 28 miles per hour, for a vehicle weighing 1,000

GRADE		SPEED IN MILES PER HOUR											
Angle of Grade	Per cent	6	8	10	12	14	16	18	20	22	24	26	28
2° 50'	5	1.3	1.7	2.1	2.6	3.0	3.4	3.8	4.3	4.8	5.2	5.6	6.0
3° 30'	6	1.4	1.9	2.4	2.9	3.3	3.8	4.3	4.8	5.3	5.8	6.3	6.7
4° 40'	8	1.8	2.3	2.9	3.5	4.1	4.7	5.3	5.8	6.4	7.0	7.6	8.2
5° 40'	10	2.1	2.7	3.5	4.2	4.8	5.5	6.2	6.9	7.6	8.4	9.0	
6° 50'	12	2.4	3.2	4.0	4.8	5.6	6.4	7.2	8.0	8.8	9.6		
8° 00'	14	2.8	3.6	4.5	5.4	6.3	7.2	8.1	9.0	10.0			
9° 10'	16	3.1	4.1	5.0	6.1	7.1	8.1	9.1	10.1				
10° 10'	18	3.4	4.5	5.5	6.7	7.8	9.0	10.1					
11° 20'	20	3.7	4.5	6.1	7.4	8.6	9.8						

MOTOR AGE

Table of Power for Hill Climbing



MOTOR AGE

Hemingway's Two-Cycle Motor

pounds. The angle as well as the per cent of the grades are given. The percent of the grades is the number of feet of perpendicular rise in 100 feet. Thus a 10 per cent grade is a perpendicular rise of 10 feet in 100 feet. If the weight of the vehicle is under or over 1,000 pounds, multiplying the horsepower obtained from the table for the required grade and speed in miles per hour, by the actual weight of the vehicle and dividing the product by 1,000 will give the required horsepower.

For example assume it is desired to ascertain the horsepower necessary to propel a 2,500 pound car up a 10 per cent grade at 20 miles

per hour. From the table the power necessary to propel a 1,000 pound car up a 10 per cent grade at 20 miles per hour is found to be 6.9 horsepower. Then 6.9 multiplied by 2,500 and divided by 1,000 equals 17.25 horsepower. The horsepowers given in the table are, of course, only theoretical deductions and allowance must be made for road conditions and friction losses.

—W. F.

TWO-CYCLE BICYCLE MOTOR

J. A. Hemingway, of Glenwood, Ill., has made patterns and is ready to furnish castings for the two-cycle bicycle motor described

in MOTOR AGE of December 11, 1902, the motor being the same in design as the one described, except that the ball bearings are omitted. The motor is of 3-inch bore and stroke and will develop $1\frac{1}{4}$ horse-power at 1,500 revolutions and 2-horse power at 1,800 revolutions per minute.

The cylinder and combustion chamber are cast integral, and may be obtained with either air cooling ribs or copper water jacket. The piston is fitted with two rings above and one ring below the wrist pin; but three piston rings can be fitted above the wrist pin if desired. The crank case is of either cast iron or aluminum with phosphor bronze bushings for the crank shaft bearings. The connecting rod is of cast steel with phosphor bronze bushings. The crank shaft, which is in two parts, is also of cast steel with a counterweight to balance the reciprocating parts. The fly wheel and driving belt pulley are cast in one piece. If desired the pulley may be turned off and a sprocket fitted instead.

Plans can be furnished for coupling two of these motors together, so as to furnish sufficient power to operate a light automobile. A complete set of blue prints is furnished with each set of castings, enabling any ordinary mechanic to machine the parts and assemble the motor. If desired the cylinder, piston and piston rings can be supplied already machined at a slight additional cost. From these castings a motor can be built which will furnish ample power to carry a 150 pound rider up any ordinary grade without pedaling.

The advantages of a two-cycle bicycle motor, are simplicity of construction, the absence of all valves and gearing, no cams or springs to wear or give out and a greater freedom from vibration than a four-cycle motor, on account of the greater number of impulses of lesser force.

Complete motors ready for use, fitted with valve, muffler and spark plug, can be furnished if desired. However, the immediate intention is to push vigorously the sale of the castings.

MOTOR NOTES FROM THE FOUR WINDS

Miss Hind, the only lady steward in the Gordon Bennett race, rides a Singer motor bicycle.

Messrs. Charles Jarrett & Letz, of London, have been appointed sole agents in Great Britain for the Oldsmobile car.

A large machine shop for the repairing of automobiles is being built by Althoff & Reid, at Aurora, Ill. The firm handles the Knox car.

Over 100 entries have already been received for the September trials to be given by the Automobile Club of Great Britain. The date of the trials has been postponed until September 18.

The firm of Schureman & Hayden, 137 South Clinton street, Chicago, electrical machinists, has been dissolved, J. W. Hayden retiring. The business will be continued at the same place by J. L. Schureman & Co.

The R. E. Dietz Co., of New York, is doing some "heavy" advertising by sending out brilliantly embellished metal signs illustrating the motor lamps made by the company. These signs are furnished to automobile stations upon request.

The stockholders of the Olds Motor Works have voted to increase the capital stock from \$500,000 to \$2,000,000 and increase the capac-

ity of the Detroit and Lansing factories so that next year fifty automobiles a day may be turned out.

W. N. Murray, of Pittsburg, Pa., has purchased the entire interest of his partner, D. N. Seely, in the Seely Mfg. Co., dealer in all kinds of automobiles. The transaction involved \$100,000, which is the capitalization of the company. Mr. Murray will make extensive improvements in the repository and machine shops of the company.

The German emperor has purchased a motor-driven plow for use on one of his estates. The motor is to consume alcohol, and as alcohol is manufactured on many large estates in Germany, this class of machine, if successful, should considerably affect the development of agriculture in the German empire, and at the same time have a notable effect on the development of the motor manufacturing industry.

Ballooning is becoming popular in France, and since Santos Dumont went to the races at Longchamps in his airship, and afterwards descended to his house, leaving his aerial vehicle waiting outside, like an ordinary cab, Parisians have begun to think seriously of adopting airships as a means of locomotion. The aerial long distance record is held by Mme. Savalle,

who has covered 408 kilometers in 19 hours, which is an average of about 14 miles an hour.

The Automobile Club of Great Britain and Ireland sent the following telegram to the German emperor on the evening of the international race: "The automobile club congratulates your majesty on the winning by your nation of the Gordon Bennett cup, which was competed for today in Ireland. The club hopes to compete next year in Germany and win it back."

Edmond F. Dodge, Chicago distributor for the Fredonia gasoline car made by the Fredonia Mfg. Co., of Youngstown, O., has leased the automobile store room at 1303 Michigan avenue, Chicago, which was until recently occupied by the Chicago branch of the Shelby Motor Car Co., and will, by the first of August, establish a display of Fredonia tonneau and runabout cars.

Grout Bros., of Orange, Mass., have issued a catalogue of Grout steam cars which, in addition to furnishing accurate descriptions of the several models of Grout pleasure and commercial cars, points out for the benefit of the laity and the undecided, the chief advantages of the Grout system of construction, doing this in a manner which is readily understandable even to the untechnical mind.

The Florida East Coast Automobile Association has decided to build a club house at Daytona, adjoining the Hotel Desland. The building will cost about \$2,000, and will be finished before the races on the beach next winter.

The Ogle County, Ill., Fair Association desires to arrange for some automobile races for August 19, 20 and 21 at the Oregon fair ground and would like to secure the attendance of Chicago motorists. J. C. Seyster is secretary.

The Gas Belt Automobile Club, of Muncie, Ind., which has been languishing, has been revived and will reorganize and form a permanent organization. Several trips have been planned for this summer. The club has about forty members.

There are now twenty-five automobiles in Nashville, Tenn., and so far not a single accident has happened. The local motorists are quite proud of their record, and say that the people of the city appreciate their care in avoiding accidents.

The Monahan Antiseptic Co., 92 Market street, Chicago, manufactures the American Green Oil soap for cleaning automobiles, and claims that it will remove mud, dirt and stains from the body and will not injure the finish, but, instead, add to its luster.

The Holley Motor Co., of Bradford, Pa., has broken ground for an addition to its factory, which will be 38 by 152 feet in size. Work is being pushed, and when completed, the new building will give the company more than double its present working room.

It is a good idea for the motorist to carry a length of piano wire in his kit. Wire about the gauge of the inlet spring can be used for making a spring of almost any strength, without need of tempering, as would be necessary with most varieties of wire used for spring making.

An automobile club was organized in Havana, Cuba, this month, with Minister Squiers president; Enrique Conill, vice-president; Rene Berdes, secretary, and Honore Laine, treasurer. The club will make a special effort to induce American automobilists to visit Cuba next winter.

Gray & Davis, of Amesbury, Mass., are sending out a mailing card with the yacht Reliance pictured in three colors. Back of the main sail is tucked a sheet of paper telling some facts about the cup defender, and then there is a talk about the yacht and automobile lamps made by the firm.

Bert Wolf has been elected secretary of the Dayton, O., Automobile Club, to succeed George Andress, resigned. President Baumann and Secretary Wolf have been appointed a committee to confer with the American Automobile Association relative to the identification of the club with the association. The club contemplates putting on a big race next year.

The park commissioners at Denver, Col., have separated the sheep from the goats in the city park by passing a resolution that hereafter at band concerts and other entertainments the automobiles must flock by themselves on one side of the pavilion, while the horses and carriages will take the other. This was done because the horses scare at the automobiles and have caused trouble in the past.

The Goodrich Rubber Co., of Akron, O., has issued an unique hanger showing the Goodrich rubber man's vacation as pictured to the advertising man in a dream. The recipe given for

the customary 2 weeks' enjoyment is: "A little of nature; a sprinkling of art; some sunshine—bottled—and rubber enough to play its part." The picture is good enough to hang on "mem'ry's wall" or, for that matter, on anybody's wall.

The exhaustive catalogue issued by Harry R. Geer, 1017 Pine street, St. Louis, Mo., contains a list of everything needed by the motor cycle user. He says he has supplies and repairs for any motor cycle on earth—other planets probably prohibited because of the tariff—and that he conducts the only exclusive motor cycle supply house in America. The various lines in the catalogue are arranged and classified to suit the convenience of the trade and the compact form makes it easy to handle.

The Columbus, O., Automobile Club made a successful run to Delaware, Magnetic Springs, Dublin and return last Sunday. There were twenty-five cars in line and not one of them met with an accident during the day. The run to Delaware, about 25 miles, was made in 1 hour and 15 minutes, which is considered rather lively running for country which is none too level. The party took dinner at Hotel Donavin and the return run was made over the circuitous route through Magnetic Springs and Dublin. The total distance covered was about 85 miles.

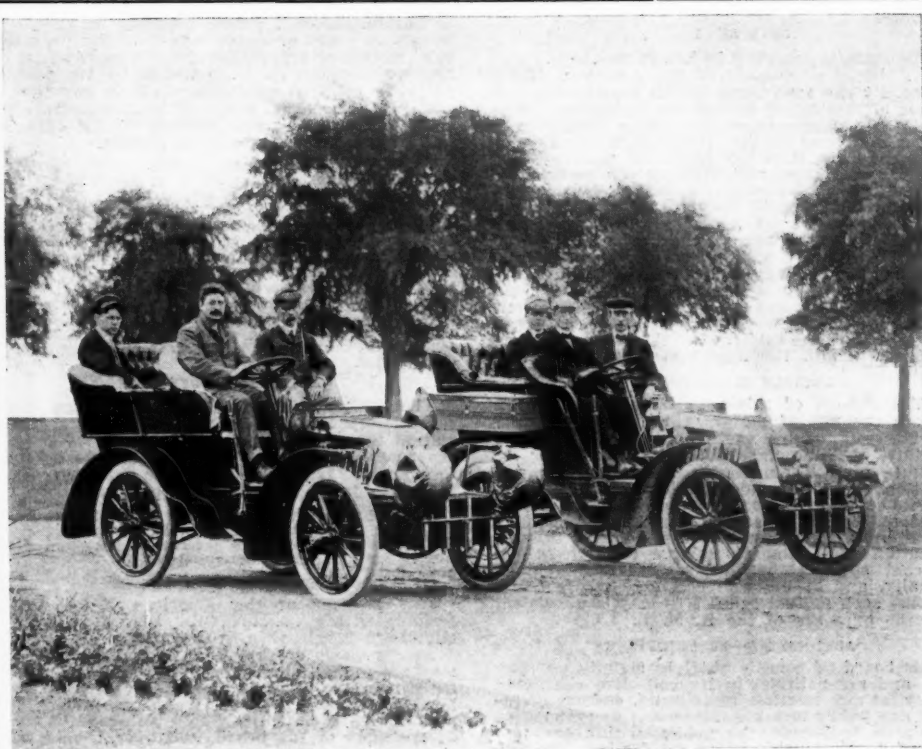
The Toledo Automobile Club last Saturday took the members of the press of that city for a run to Point place, where dinner was served, the return to the city made in the gloaming. This action was taken as a slight return for the many courtesies extended the motorists by the press, and at the same time to give them a practical demonstration of the workings of the automobile. If clubs in other towns would take similar action, they would be aiding the cause materially, as the newspaper men would learn that automobiling is not such a dangerous sport, after all.

A National electric automobile left standing by its owner on Monument place in Indian-

apolis, Ind., one day last week, was tampered with by some inexperienced person. The machine started in one direction and the investigating person went the other. The monument was in the course of the automobile, but that didn't worry the machine. It struck the curb, and then with a jolt went over into the fountain. The motor continued to work, churning the water like a Mississippi stern-wheeler. William Compton waded in and drove the car back to dry land. The only injury was a broken axle.

William Brown, of Elwood, N. J., owns a traction threshing machine. He has been reading the newspaper accounts of motor car drivers being arrested for traveling without license, and in order to be on the safe side and keep out of the clutches of the law he has applied for a license for his thresher, which he swore could not run faster than 3½ miles an hour. He also testified to his ability to drive this machine along the highways and not run over vehicles. He said his machine made less noise and created far less smell than any other automobile on the road, and that it would not get out of order and block the highway. After verbally promising the clerk that the thresher would not be driven at a rate to exceed 30 miles an hour, Brown was given a license.

During the hailstorm in Chicago a few days ago E. D. Martin was driving his new gasoline Locomobile along Michigan boulevard. To get out of the storm he made a run for the Locomobile repository at Fourteenth street. When his car reached the historic mud hole on Fourteenth street it went into the mud nearly up to the axles. Mr. Martin was in a hurry, and thinking the car could not get through, he jumped out and ran indoors. After the rain, Manager Sykes donned a pair of rubber boots and waded out to the car. The group of bystanders were expecting to see him fail in running the car to dry land, and numerous suggestions regarding ropes and horses were volunteered. But it is reported that, much to the surprise of every one, the car started without even cranking, and went out easily.



MOTOR AGE

The 16-Horsepower Locomobile and the Man Who Made It—A. L. Riker Driving Car on the Left

AMERICAN MOTOR LEAGUE OFFICIAL BULLETIN

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W. GRANT MURRAY, 2d Vice-Pres., Adrian, Mich.
S. W. MERRIHEW, 3d Vice-Pres., 154 Nassau St., New York.

ROBERT L. STILLSON, Sec'y, 150 Nassau St., New York.
FREDERICK B. HILL, Treas., 32 Binford St., Boston.

NATIONAL HEADQUARTERS, 150 NASSAU STREET, NEW YORK

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Frederick B. Hill.....Boston
E. B. Olmsted.....Buffalo
P. L. Hussey.....Toledo
W. Grant Murray.....Adrian, Mich.
John A. Bechtel.....Milwaukee
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ROAD IMPROVEMENT

R. E. Olds.....Lansing
Harold M. Brown.....Boston
Harry Unwin.....New York
George E. Hannan.....Denver
W. H. Kirkpatrick.....Hartford

LOCAL ORGANIZATION

Charles F. Potter.....Denver
H. W. Chapin.....Syracuse
Edwin F. Brown.....Chicago
Henry F. Spaulding.....Buffalo
S. W. Merrihew.....New York
Charles B. Shanks.....Cleveland

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Ernst J. Berg.....Schenectady, N. Y.
Alexander Winton.....Cleveland
A. L. Riker.....Short Hills, N. J.
Elmer Apperson.....Kokomo, Ind.
Clark Slintz.....Grand Rapids, Mich.
Julius W. Walters.....Jersey City

RACING

A. G. Batchelder.....New York
Albert Mott.....Baltimore
Geo. G. Greenburg.....Chicago
Chas. W. Mears.....Cleveland
J. C. Kerrison.....Boston
John N. Sharp.....Salt Lake City
C. W. Carpenter.....San Francisco

MEMBERSHIP

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John Wilkinson.....Syracuse
W. K. Cowan.....Los Angeles, Cal.
John M. Clark.....Columbus, O.
S. E. Gifford.....Chicago

SIGN BOARDS

John B. Price.....Hazleton, Pa.
Edw. W. Barnes.....Perth Amboy, N. J.
E. W. Roberts.....Clyde, Ohio
W. J. Morgan.....Newark, N. J.
B. G. Campbell.....Milwaukee
G. W. Poley.....Norristown, Pa.

PRESS

Jos. Estoclet.....Philadelphia
John C. Wetmore.....New York
John J. Donovan.....Boston
Louis R. Smith.....New York
Arthur N. Jervis.....New York
C. G. Sinsabough.....Chicago
W. Horace Lerch.....Buffalo

LOCAL BOARDS OF CONTROL

Every town that contains five or more automobilists—or that many persons who are "friendly" to the use and development of motor vehicles—should contain a board of consuls of the American Motor League. A board of consuls is a club under another name. It gives the members a chance to do the work of the league and acquire its benefits right at home. It shares in the funds, in the work, in the honors of the American Motor League. There are two ways to handle the club question. One is to form a club and then have the club join the league and put up its assessment whenever the call comes from headquarters; the other way is first to form the league and then form a consulate, or board of consuls, within the big organization, and share in its funds for local work. One-third of all dues received from a state goes back to these local bodies. The consulate is the thing. Below is a form of constitution and by-laws for a board of consuls. It is advisable to preserve this copy of MOTOR AGE for future reference. Any worthy and earnest member may become a consul and receive his appointment from the president. The suggested constitution is as follows:

ARTICLE I

This organization shall be known as the board of consuls of the American Motor League. By the acceptance of this constitution the consuls of this board declare for themselves, their associates and successors, a supreme allegiance to the national body of the American Motor League and to the laws, rules and governing powers thereof, and so declaring and avowing the said founders recognize and accept the lawful charter and directions of the said league as the direct and authorized medium by which this consulate shall receive its official power and authority, recognizing the right of said league by its officers to withdraw, cancel or annul the charter of this consulate at any time when such act shall to said officers seem wise and proper. Such withdrawal, cancellation or annulment of the consulate charter shall terminate the existence of this body as an organization within the American Motor League.

ARTICLE II—OBJECTS

The objects of this organization shall be to promote the use of motor vehicles and the general interests of all users of such vehicles; to ascertain, defend and protect their rights; to facilitate touring; to secure improvement in the condition of public roads and highways, and generally to sustain the work and objects of the American Motor League as set forth in the constitution of that body. In pursuit of these objects this organization shall aim to enlarge and promote a fraternal spirit among users of power vehicles generally, and by unity of action to secure to its members such mutual benefits as may be consistent with the purposes of the A. M. L.

ARTICLE III—RESTRICTIONS

This board of consuls shall be strictly non-partisan and non-political in its collective character. It may, at any meeting, recommend, endorse or approve any public measure, movement or proposition calculated to benefit the public, within the purview of A. M. L. objects, as set forth in its constitution, or to advance the interests of users of motor vehicles, or to achieve any patriotic purpose; it may, in like manner, disapprove, condemn or protest against any measure, movement or proposition which, in the judgment of the board

THE AMERICAN MOTOR LEAGUE

is an organization to promote the interests of all users of motor vehicles; to ascertain, protect and defend their rights; to oppose and prevent the enactment of unreasonable and oppressive laws; to encourage the use of motor vehicles by agitation and instruction; to provide its members with printed routes, maps and guide books by which touring may be facilitated and encouraged; to promote the work of improving the public roads and the erection of proper guide boards, and other signs, necessary to guide and warn the users of motor vehicles; to select and appoint official hotels, repair shops and supply stations where its members may obtain reliable service at reasonable rates.

WHO MAY BECOME A MEMBER

"Any man or woman, 18 years of age or over, of good moral character and respectable standing, friendly to the motor vehicle and its interests, shall be eligible to membership."

(Constitution, Article 2, Section 1.)

The League is extending its membership in all parts of the country. We invite all friends of the movement to join and aid in building up a powerful organization.

NO INITIATION FEE. ANNUAL DUES \$2 IN ADVANCE, OR \$3, INCLUDING 1 YEAR'S SUBSCRIPTION TO MOTOR AGE.

is hurtful to such public interests or to the interests of users of motor vehicles; but no resolution, motion or proposition for the approval or disapproval, support or condemnation of any political party or political candidate shall at any time be entertained or acted upon, or in any manner officially recognized at any meeting of this consulate or by any officers or members thereof.

NOTE—The plain object of this article is to welcome to the ranks of the board, members of all political parties, to forbid any action by the board which may be offensive to the political faith or principles of any of its members, and to discourage every attempt of politicians and political candidates to commit the board to the support of particular persons or parties. The board may make widely known its position on questions affecting the works and objects of the A. M. L.—road improvement, etc.—and its members may decide as individuals what candidates they deem worthy of support, but upon these questions no consulate action should be taken, except in the most prudent and unofficial manner.

ARTICLE IV—OFFICERS

The officers of this consulate shall be a senior consul, a junior consul, a secretary, a treasurer and, at the option of the board, either five or seven governors, composed of the four officers hereinbefore named, together with other members of the consulate duly elected for that purpose.

NOTE—These seven officers are found by experience to answer all requirements of a local organization and are suggested in order to preserve uniformity of system in the government of consulates.

ARTICLE V—MEMBERSHIP

Any member of the American Motor League residing within shall be eligible to membership in this board.

Any member of the A. M. L. whom the board may see fit thus to honor, provided he be not an active member, may be elected to honorary membership. Honorary members shall be exempt from all dues, shall be entitled to a voice, but no vote, at meetings of the board, and cannot hold office.

NOTE—As all consulates, having not less than a stated number of members, are entitled to representation in the state board of officers it is vitally necessary that only members of the A. M. L. shall be permitted to take active part in its meetings or in the directing of its affairs. Hence the form of Article

V. here prescribed. Insert the name of town, village, county or other limit of territory in which members must reside. This limit is to be determined by the members who adopt this constitution.

ARTICLE VI—GOVERNORS

The governors shall have full charge and control of all property, effects and assets of the consulate; shall receive, consider and decide by ballot upon all applications for membership, and all charges of misconduct and violation of rules, which may render any member liable to censure, suspension or expulsion. Any and all proceedings taken by the governors relating to the expulsion of a member shall be by them reported to the consulate at the regular meeting thereof next succeeding; and at such regular meeting the said proceedings of the governors shall be subject to review, and may by such meeting be modified or rescinded by the assent of a two-thirds vote of the members present at such regular meeting.

NOTE—The powers of the governors—who include all consulate officers—should be extensive and complete and the form here suggested for Article VI. has been found worthy of approval. If care be taken in the selection of able, prudent and conservative governors, the affairs of the consulate will be better and more wisely managed than would be the case if important business were transacted by a general meeting of the entire consulate.

ARTICLE VII—AMENDMENTS

This constitution shall not be altered or amended except upon a proposition setting forth the exact language of the proposed amendment, and submitted in writing at a regular meeting of the board, when such proposition shall be entered upon the minutes. At the next regular meeting of the board the proposed amendment shall be acted upon, and shall be adopted only upon a three-fourths affirmative vote of the active members present; provided, however, that no amendment to this constitution shall be adopted which shall be inconsistent with the constitution, objects or purposes of the American Motor League.

NOTE—This article sets forth the usual procedure in case amendments are proposed and acted upon. If another or more elaborate method be deemed better—the requiring that proposed amendments be posted on the bulletin of the consulate for a given number of days—of course it is quite within the power of the consulate to make changes to suit the judgment of its members.

The by-laws to accompany this constitution will appear in the next issue of MOTOR AGE.

OFFICIAL HOTELS

When you travel, take your membership ticket with you. Every official league hotel is under contract to allow a discount to our members, in no case less than 10 per cent from regular rates. This rule holds whether you are touring with your automobile or traveling in any other way.

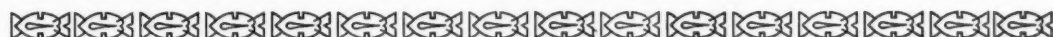
We aim to appoint only good hotels; but a good hotel is not necessarily a grand or an elaborate one. Good food, proper attendance, cleanliness, comfortable rooms and beds are the prime requirements and in small towns, where the modest hostelry is otherwise acceptable, the appointment is not refused for lack of metropolitan conveniences. Our members are requested to recommend strictly good hotels for official appointment. Write to the secretary. All letters are confidential.

Topeka, Kan., has eighteen automobiles, of which three are electric, three steam, and twelve gasoline.

NOTICE

TO MANUFACTURERS, DEALERS, IMPORTERS,
AGENTS AND USERS OF

Gasoline Automobiles

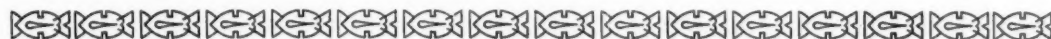


United States Letters Patent No. **549,160**, granted to George B. Selden, November 5, 1895, controls broadly all gasoline automobiles which are accepted as commercially practical. Licenses under this patent have been secured from the owners by the following named manufacturers and importers:

Electric Vehicle Co.	Pope Motor Car Co.
The Winton Motor Carriage Co.	The J. Stevens Arms & Tool Co.
Packard Motor Car Co.	H. H. Franklin Mfg. Co.
Olds Motor Works	Charron, Girardot & Voigt Co. of
Knox Automobile Co.	America (Smith & Mabley)
The Haynes-Apperson Co.	The Commercial Motor Co.
The Autocar Co.	Berg Automobile Co.
The George N. Pierce Co.	Cadillac Automobile Co.
Apperson Bros. Automobile Co.	Northern Mfg. Co.
Searchmont Automobile Co.	Pope-Robinson Co.
Locomobile Co. of America	The Kirk Mfg. Co.
The Peerless Motor Car Co.	Elmore Mfg. Co.
U. S. Long Distance Automobile Co.	E. R. Thomas Motor Co.
Waltham Manufacturing Co.	

These manufacturers are pioneers in this industry and have commercialized the gasoline vehicle by many years of development and at great cost. They are the owners of upwards of four hundred United States Patents, covering many of the most important improvements and details of manufacture. Both the basic Selden patent and all other patents owned as aforesaid will be enforced against all infringers.

No other manufacturers or importers are authorized to make or sell gasoline automobiles, and any person making, selling or using such machines made or sold by any unlicensed manufacturers or importers will be liable to prosecution for infringement.



Association of Licensed Automobile Mfrs.
No. 7 EAST 42d STREET, NEW YORK

THE PACKARD TRANS

Hundreds of automobilists will probably have great difficulty in considering the illustration on these two pages without some doubt regarding the actual existence of such conditions except in remote and isolated places, sought out by the photographer for advertising purposes, and as to believing that they represent daily scenes for over two thousand miles of travel, will probably



IN SOLDIERS CANON

out the south-eastern portion that great distances were traveled by our party using a compass for direction across a country almost entirely devoid of vegetation, and so scored by the elements as to present difficulties never before encountered by an automobilist, and before which defeat would have carried no disgrace.

"ASK THE MAN

WHO OWNS ONE."

scoff at the idea. And yet consider the state of Nevada equal in area to the four states of Pennsylvania, New York, Connecticut and New Jersey, and having a population of only 45,000, and you will instantly recognize why it is that there is no attempt at road building and that the trails are of a nature made them.

With an ax to clear the way through the sage brush and pick and shovel to enable them to descend into the dry beds of rivers and ascend their precipitous banks our party brought "Old Pacific" through the trackless deserts of Nevada in eight days, with the remarkable average of over seventy miles per day, for this hitherto unconquerable section.

When the car started from San Francisco it carried an apron to protect the chain, but the sage brush of the first hundred miles reduced it to shreds, and the flying particles of sand together with the ceaseless scraping of the vegetation have worn the axles and braces as bright as gun barrels.

Utah has proven a far more severe trial than anything so far encountered. For years there has been so little travel through



FORDING A FLUME

CONTINENTAL TRIP.

Colorado with its dizzy altitudes, its steep ascents and precipitous slopes has been an easy task for "Old Pacific" when compared with the dreary wastes of Utah and Nevada sand.

A simple adjustment enabled the motor to develop its full power in spite of the rarefied air, and no mountain grade was ever so steep but "Old Pacific" could climb it with an eagerness almost human.

When the wheels would slip they were wrapped with chains to increase their traction. When, by their own power, they buried themselves in the sands or swamps, brush was cut and fed to them until they rode themselves out of their own difficulty by the same power which had taken them in.

And here it will be well to emphasize one fact—there has not been the slightest assistance asked or given by man or beast since our car left San Francisco.

It has never been towed by horses, carried by trains, or given one pound of help from any outside source whatever.

No matter how great the odds, they have been squarely met and overcome by a

STANDARD 1903 MODEL F PACKARD MOTOR CAR.

Quoting the Denver Republican of July 15th, "They rode into Glenwood, Colorado, to-day on a machine in as perfect condition as when they caught their last glimpse of the sea lions upon the rocks.

"It has never been out of order a minute on the trip, and promises to cavort up Fifth Avenue at the trip's conclusion as jauntily as it rolled into Glenwood this evening."

It can carry "A message to Garcia."



AN EASY STRETCH



CUTTING A ROAD THROUGH SAGE BRUSH



USING BRUSH TO AVOID SINKING

Packard Motor Car Company

Members Association Licensed Automobile Manufacturers

Warren, Ohio.

ACROSS THE

The remarkable performance of Dr. H. Nelson Jackson's successful attempt to cross the American Continent, was

GOODRICH AUTOMOBILES



He made the entire trip, a distance of 3,428 miles, fitted in San Francisco. The route being over the Rocky Mountains, and the vast trackless



A Feat Unequaled in the History



THE B. F. GOODRICH

AKRON RUBBER WORKS

New York: 66-68 Reade Street
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Cleveland: 414 Huron Street
Chicago: 141 Lake Street

CONTINENT

on, of Burlington, Vt., who has just completed the first
as accomplished on a Winton Touring Car fitted with

CLINCHER MOBILE TIRES

miles, by road, on the Original Goodrich Tires,
over the worst roads in America, including
barren deserts of the West, makes this

History of Pneumatic Tires



GOODRICH COMPANY,

WORKS, AKRON, OHIO

Huron Street
Street

Boston: 157 Summer Street
Buffalo: 9 West Huron Street

Denver: 1444 Curtis Street
London, E. C.: 7 Snow Hill

TIME IS MONEY

A Knox Gasolene Delivery Car

will deliver your goods in half the time
and at half the expense of horses.

THE CAR
THAT NEVER
DRINKS

CAN
MAKE PROMPT
DELIVERIES



ALL SEASONS
ARE ALIKE
TO THE

Waterless
Knox

1,000-lb. Delivery Car, with top,	\$1,600.00	Without top,	\$1,500.00
400-lb. " " " "	1,400.00	" "	1,300.00

For SIMPLICITY, RELIABILITY and CON-
VENIENCE the KNOX CARS
are incomparable.

Send for descriptive circular and record of actual performances.

Knox Automobile Co., Springfield, Mass., U.S.A.

MEMBERS OF ASSOCIATION OF LICENSED AUTOMOBILE MANUFACTURERS

PRINCIPAL AGENCIES:

New York, H. M. Davis, Mgr., 146 W. 39th St.
Boston, Reed-Underhill Co., 41 Stanhope St.
San Francisco, National Automobile & Mfrs. Co., 134-148 Golden Gate Ave.
Philadelphia, Banker Bros. Co., 629 N. Broad St.
Pittsburgh, Banker Bros. Co., Baum & Beatty Sts.
Chicago, A. C. Banker, 456 Wabash Ave.
Minneapolis, Northwestern Motor Vehicle Co., 112 So. 6th St.
Fall River, Mass., J. Edward Newton.
Providence, R. I., Davis Automobile Co., 79-83 Mathewson St.
Grand Rapids, Mich., Adams & Hart.

Hartford, Conn., Brown, Thomson & Co.
Brockton, Mass., W. H. Marble, 152 High St.
Paterson, N. J., F. W. Stockbridge, 450 Broadway.
Marlboro, Mass., A. M. Page.
St. Louis, Mississippi Valley Auto Co., 3935 Olive St.
Worcester, Mass., Worcester Automobile Co., 84 Exchange St.
Denver, Geo. E. Hannan, 1455 California St.
Milwaukee, Wis., Geo. A. Crane, 187 Wisconsin St.
Kansas City, Hogan-Irvin Co., 1221 McGee St.
Louisville, Sutcliffe & Co., 1051 Third St.

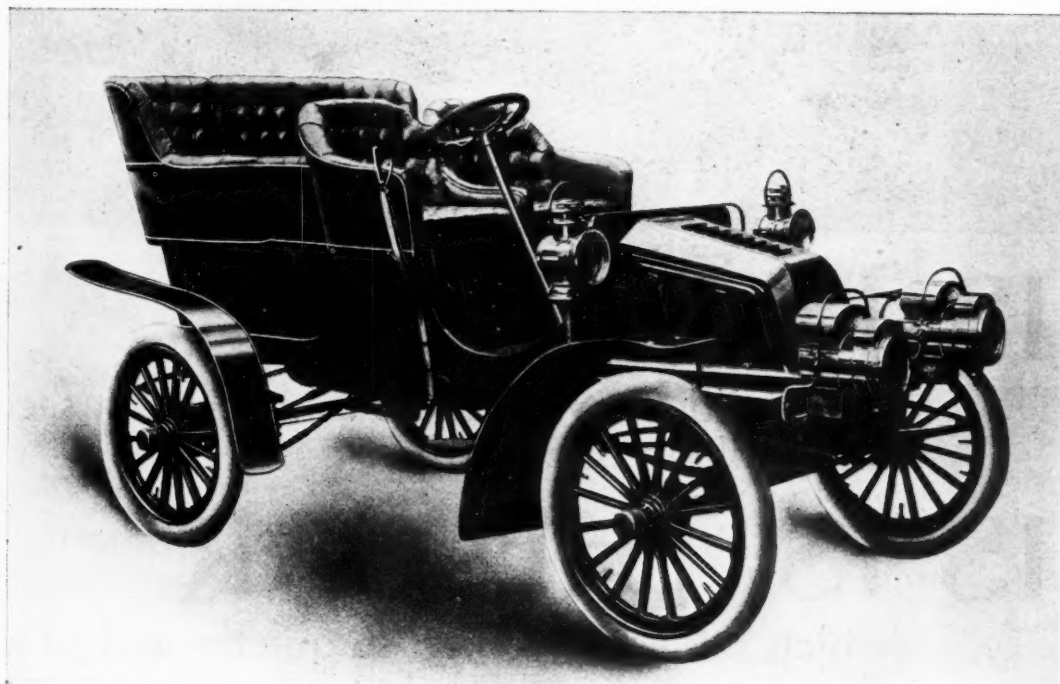
FOR DAILY USE
 FOR DAILY USE
 FOR DAILY USE
 FOR DAILY USE
 FOR DAILY USE
 FOR DAILY USE
 FOR DAILY USE
 FOR DAILY USE

FREDONIA

Model No. 2

SIMPLICITY
 STRENGTH
 RELIABILITY

FOR D
 FOR D
 FOR D
 FOR D
 FOR D
 FOR D
 FOR D
 FOR D
 FOR D
 FOR D



PRICE, \$1,250.00

FOR DAILY USE
 FOR DAILY USE
 FOR DAILY USE
 FOR DAILY USE
 FOR DAILY USE
 FOR DAILY USE
 FOR DAILY USE
 FOR DAILY USE

FREDONIA TONNEAU NO. 2.

DESCRIPTION.—Four passenger, weight 1,500 pounds, 10 horse power motor, normal motor speed 600 revolutions, one cylinder, 6-inch bore by 6½-inch stroke, jump spark, dry batteries, speed ratio between motor and wheels on fast speed three to one, wheel base 87 inches, track 56 inches, wheel diameter 30 inches, wheels wood, tires 3-inch Clincher, live rear axle, roller hub bearings, two brakes, hub brake on rear wheels, planetary gear transmission, speed 6 to 25 miles an hour, chain drive to axle, wheel steering, gasoline tank capacity 9 gallons, water 3 gallons, water circulation by pump and radiating coil, lubrication by gravity feed, radius on one charge 150 miles.

9 H. P. RUNABOUT, \$1,000

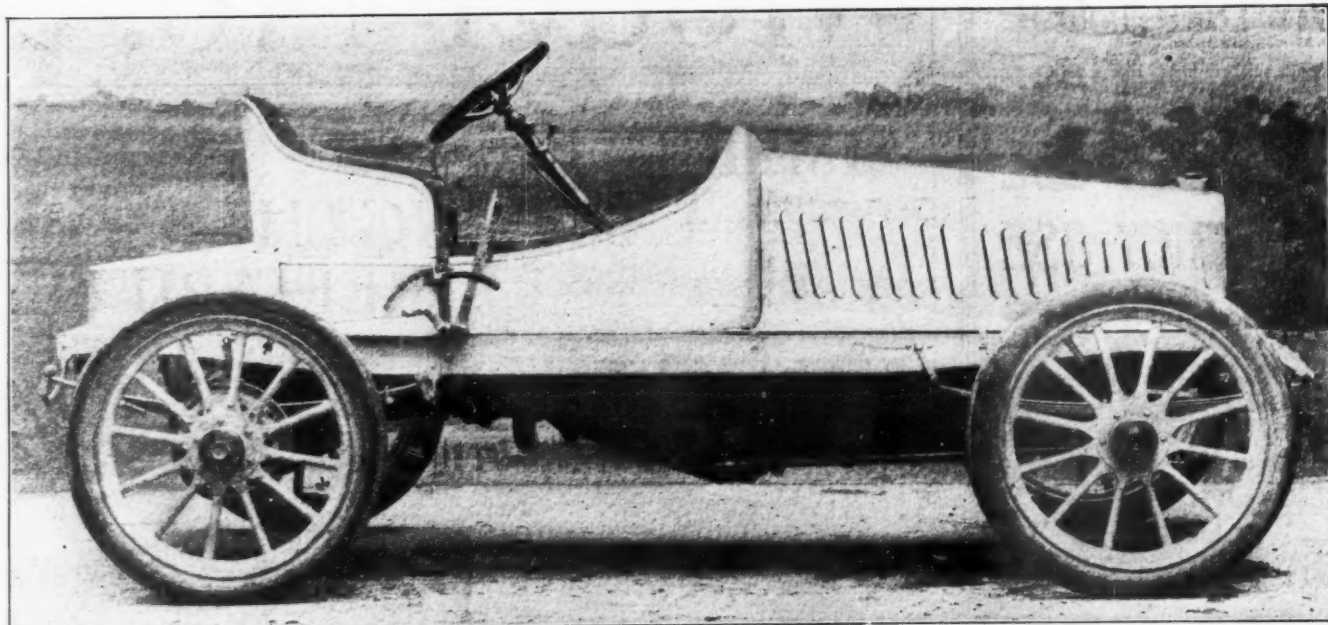
WINNER OF THE PRESIDENT'S CUP IN THE NEW YORK - BOSTON RELIABILITY TEST. . . .

FREDONIA MANUFACTURING CO., Youngstown, Ohio, U. S. A.

Chicago Agent: Edmond F. Dodge, of P. G. Dodge & Co., 2116 Lumber St.
 EXHIBITED AT 1303 MICHIGAN AVENUE

THIS IS THE CAR

which won the open fifteen-mile race at the Empire City Trotting Track at Yonkers, last Saturday.



THIS IS THE CAR

which did not vary more than 1-5 of a second, mile after mile in fifteen miles.

THIS IS THE CAR

which ran so smoothly, so quietly and so uniformly that everyone marveled at it.

THIS IS THE CAR

which made a world's record for its class in the trials.

THIS IS THE DECAUVILLE CAR

STANDARD AUTOMOBILE COMPANY OF NEW YORK

SOLE UNITED STATES AGENT,

136 West 38th Street, near Broadway.

Phone 476 38th Street.

NEW YORK CITY.

Cable DRADNAT, N. Y.

The DARRACQ

Makes World's Records in America as Well as in Europe

At the Empire Track, Yonkers last Saturday the DARRACQ eclipsed all previous performances for light weight cars.

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In the **Five-Mile Event**, Empire City Track, July 25, 1903, between F. A. La Roche and Barney Oldfield, La Roche **broke all previous records** for standard make of machines of any class or weights, covering the distance

5 Minutes, 13 2-5 Seconds.

AMERICAN DARRACQ AUTOMOBILE COMPANY

F. A. LA ROCHE COMPANY, Sole American Importers and Distributors,

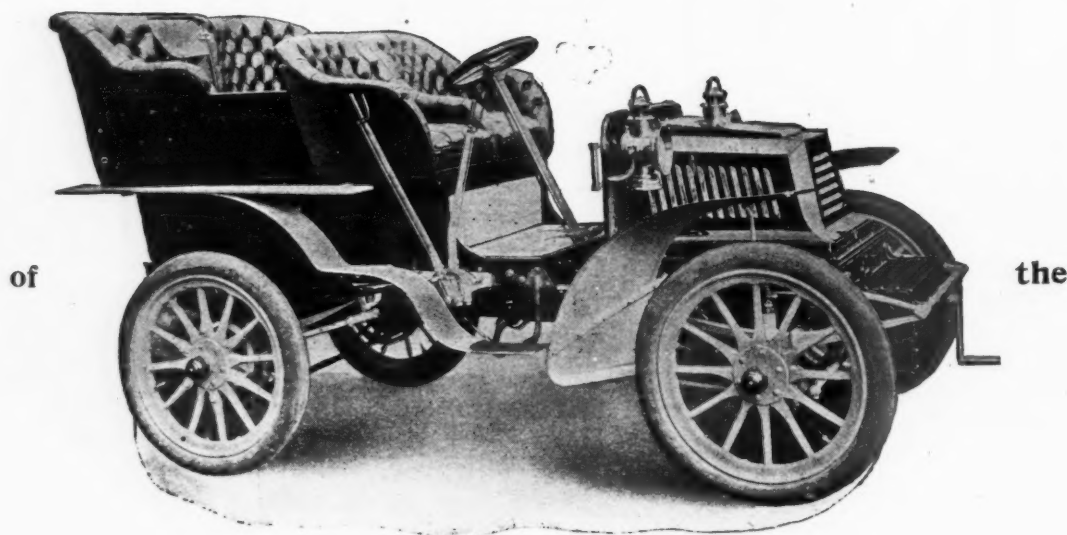
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At Columbus, Ohio, July 4th, Barney Oldfield broke all existing records from one to ten miles, establishing a new table of world's records as follows:

OLDFIELD'S RECORD AT COLUMBUS, OHIO, JULY 4, 1903

1st mile . . .	56 2-5	One Mile . . .	:56 2-5
2nd " . . .	59	Two Miles . . .	1:55 2-5
3rd " . . .	59 3-5	Three Miles . . .	2:55
4th " . . .	1:00	Four Miles . . .	3:55
5th " . . .	59 3-5	Five Miles . . .	4:54 3-5
6th " . . .	59 3-5	Six Miles . . .	5:54 1-5
7th " . . .	1:01	Seven Miles . . .	6:55 1-5
8th " . . .	1:00	Eight Miles . . .	7:55 1-5
9th " . . .	59 3-5	Nine Miles . . .	8:54 4-5
10th " . . .	1:00	Ten Miles . . .	9:54 4-5
TOTAL . . .	9:54 4-5	Mile Average . . .	:59 4-5

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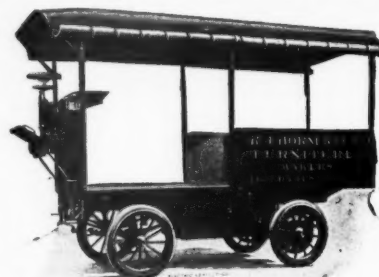
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**In
the
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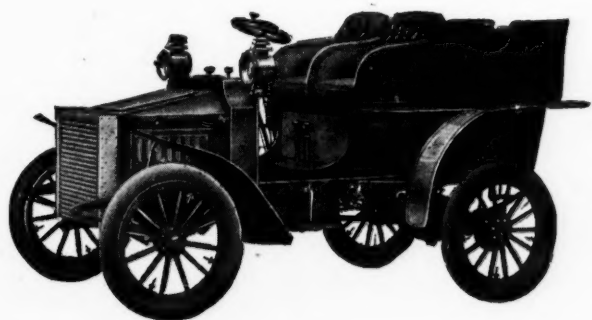
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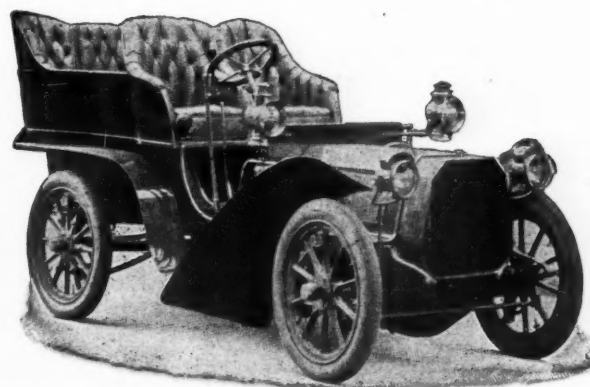
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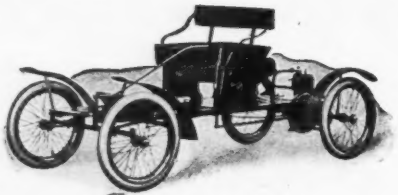
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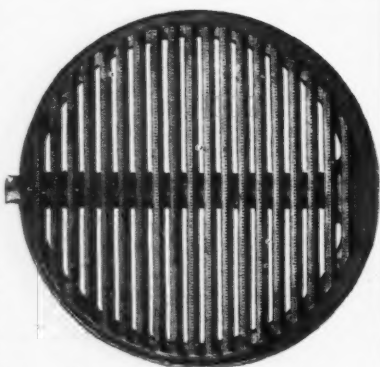
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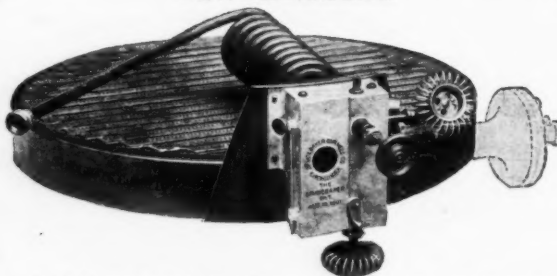
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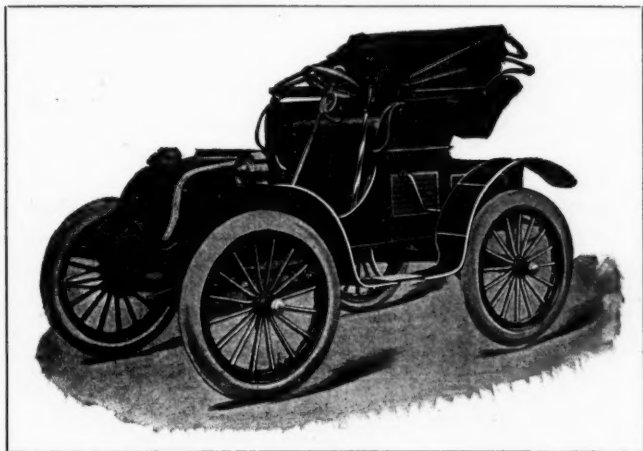
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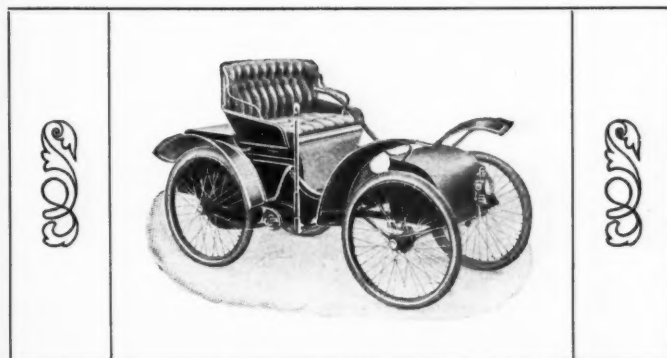
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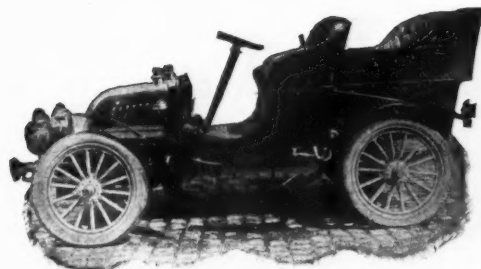
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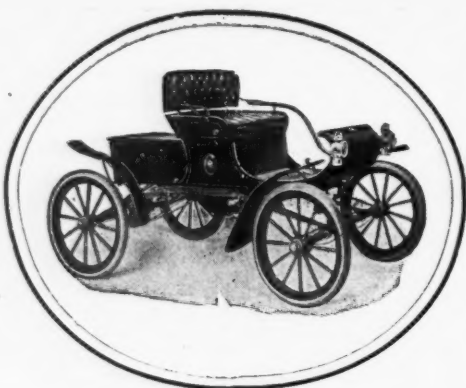
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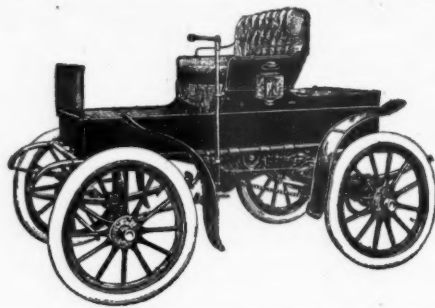
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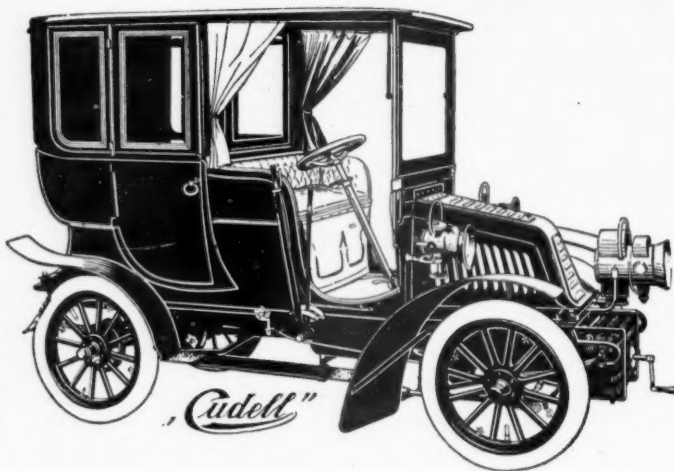
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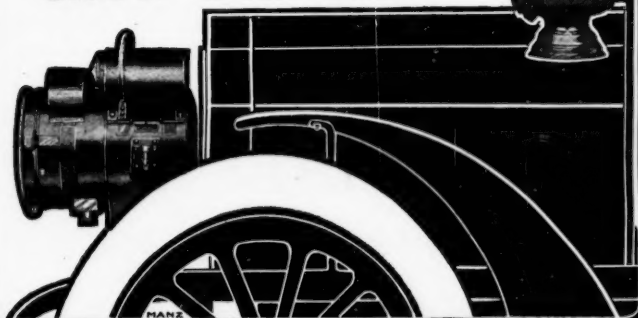
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Foreign automobiles have often been defeated in track and hill climbing contests by Peerless cars of less horse power. Peerless Touring Cars have never been defeated in a hill climbing contest, and never lost a contest with a car of equal horse power.

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Peerless Touring Cars are built strong enough to withstand strains from riding over rough roads, and their mechanism is simple and easily understood.

*Can we send you additional information?
Address Dept. C.*

The Peerless Motor Car Co.,

Members Association of Licensed Automobile Manufacturers,

CLEVELAND, - OHIO.

Agencies in the principal cities.

Merit backed up by actual
experience has won for the

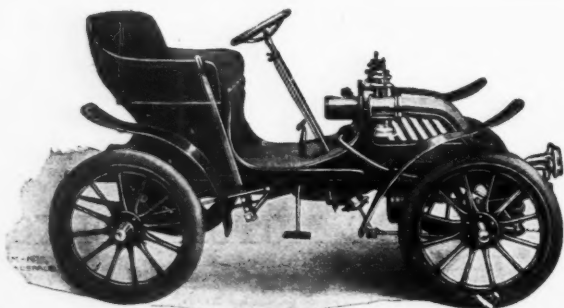
PREMIER

the name of being a fast touring car and a good hill climber. The PREMIER Motor Car is built to meet the approval of automobilists who, as the result of experience, have become discriminating buyers.

Premier Motor Mfg.
Co., Indianapolis, Ind.

Holley Light Touring Car \$650

BUILT FOR STEEP HILLS AND ROUGH ROADS.



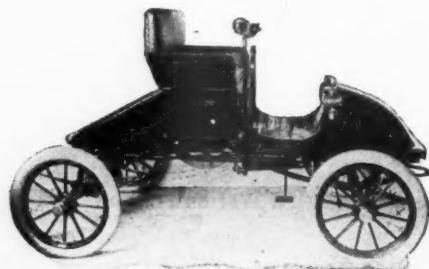
Come to the factory and let us give you a ride over our "demonstrating course." A dealer from Louisville, Ky., recently said: "I am convinced that your car is all that you claim as it would have to be well constructed to stand these roads." That is what they all say.

Holley Motor Co.
BRADFORD, PA.

The MONARCH CAR

\$750.00 \$750.00

IMMEDIATE DELIVERY

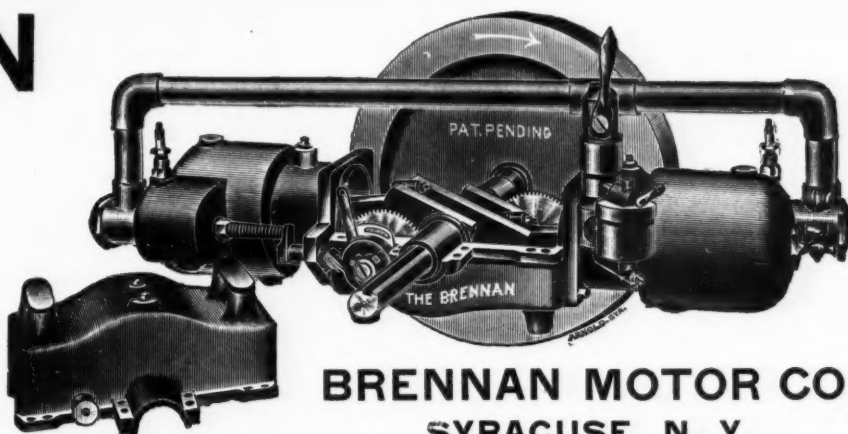


5 H. P. Simple construction, easily operated.
Large compartment under hood for luggage.
Call and inspect at any time.

P. J. DASEY COMPANY,
21 La Salle Street - - Chicago.

BRENNAN

Recognized by the trade as the leading American Motor. Built in sizes from 4 to 30 horsepower. Special 15 and 20 horsepower patterns with transmission gear attached. One good thing about our motors is that the users like them. Take their word for it—not ours. Ask for letters from Brennan users; also for catalogue.



BRENNAN MOTOR CO.
SYRACUSE, N. Y.

MOTORS

Our Hood Department

is receiving every attention. Our goods are stylish and prices right. Any design.

We make

**Fenders, Metal Bodies,
Tanks, Radiators, Etc.**

We are equipped to make

Small Forgings.

ESTIMATES FURNISHED ON APPLICATION.

he Wilson & Hayes Mfg. Co.,

46-50 Guard Street, Cleveland, Ohio.

The Woodward Burner

*We Believe in it and Recommend it
Buyers Believe in it and Recommend it*



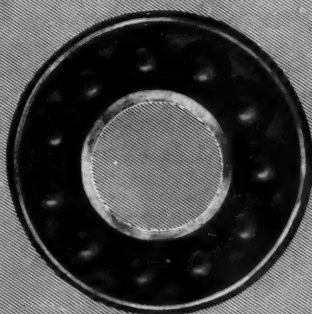
Faith in one's own product is one of the secrets of success in marketing. We have unqualified faith in **THE WOODWARD BURNER**. :: It has a record of **Fifteen Miles on One Gallon of Gasoline**. :: Its construction is scientific. Its top plate is flexible and Tubes screw in bottom plate, and if for any cause Tubes have to be removed all that is necessary is a wrench. It makes no carbon. It cannot backfire—absolutely impossible. It makes steam so that even on hills you have enough and to spare. Its flame is blue and twelve inches long, which means that it gives more heat than other burners. It is durable—will last as long as any other part of the vehicle. We guarantee this. :: For proof of any and all claims here made we refer to the boiler itself. :: It will prove them to your satisfaction if you will give it a trial.

—THE—
Woodward Burner & Specialty Works

1111 W. Washington St., Indianapolis, Ind.

STEEL

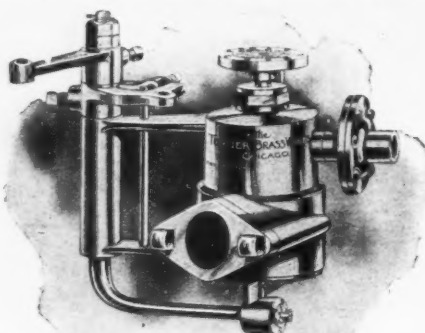
Something more than
a micrometer is needed to
distinguish good balls
from bad ones.



BALLS

The test of quality lies
in service. The best balls
are known as "High Duty."
We make them.

FEDERAL MANUFACTURING COMPANY
CLEVELAND BALL FACTORY—Cleveland



A sample of the New Turner Carbureter will be sent to properly rated manufacturers without deposit. Otherwise cash with order.

ALWAYS UNDER CONTROL

The New Turner Carbureter

makes every man thorough master of his engine. It is so simple in construction and adjustment that the amateur can get as perfect results as the expert. It is the only carbureter that compensates for all changes of speed of motor and allows for any amount of throttling without changing the mixture.

THE TURNER IS THE 1904 CARBURETER.

Send for Catalogue M. A.

Manufactured by **THE TURNER BRASS WORKS, 59 Michigan St. CHICAGO**

Brandenburg Bros. & Alliger, New York-Chicago, General Sales Agents.



Perfectly Simple—Simply Perfect.

...THE...

THOMAS TONNEAU



Because of great simplicity of construction and operation; because it is artistic, comfortable, safe, quiet, odorless...

IS THE LADIES' FAVORITE..

Because they know they can start the

motor and drive the car easily without help. A ride with a jolly party of friends is a **FASCINATING PLEASURE.**

Call or Write for Catalogue.

E. R. THOMAS MOTOR CO.

Factory: No 1202 Niagara Street. **BUFFALO, N. Y.**

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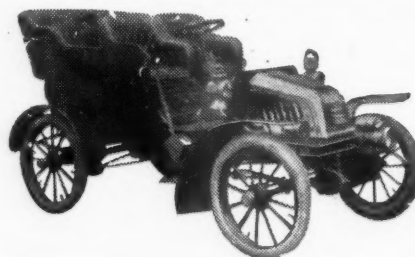
BOSTON, 145 Columbus Ave. CHICAGO, 5311 Cottage Grove Ave.
NEW YORK, 52 W. 43d Street. PHILADELPHIA, 832 Arch St.

THE AUTOMOBILE PROBLEM SOLVED

....BY THE....

SANTOS-DUMONT

A high-grade two-cylinder Tonneau. Price, \$1,500. In appearance, power and general results fully the equal of any \$6,000 French car on the market.

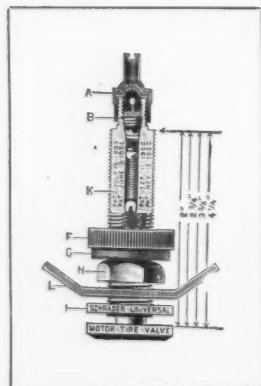


Many prospective automobile purchasers have been waiting until a practical, speedy, powerful car should be put on the market without a "fad" price.

We have met these conditions in the Santos-Dumont. It is a combination of all the best features of the high-grade French and American machines. Roomy, splendidly finished Tonneau. High-grade material and workmanship throughout. The most noiseless and perfect gasoline engine ever constructed. Two-cylinder opposed type doing away with vibration. It combines power, speed and durability with great simplicity and ease of handling. Don't purchase until you have thoroughly investigated the Santos-Dumont.

THE COLUMBUS MOTOR VEHICLE CO., COLUMBUS OHIO

THE CADILLAC AUTOMOBILE CO., 1312 Michigan Ave., Chicago Representatives.



Schrader Universal Valve

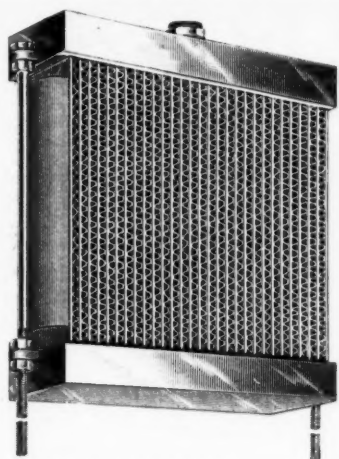
TRADEMARK REGISTERED APRIL.

Simple and Absolutely Air Tight

Motor Tire Valves, as shown in cut, are made in four lengths as shown. Cut is exactly half size of the 2-inch valve. Supplied to the trade by all Tire Manufacturers.

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A. SCHRADER'S SON, 30-32 Rose St., NEW YORK



"A Radiator That Radiates."

Our Radiators are Practical, They Can Be Relied On to Keep Your Motor Cool Under All Conditions. :: Simplicity of Construction Makes the Price Low. :: It Is Strong Enough to Stand the Hardest Jolts and Strains. :: If the Question of Cost Means Anything to You, Write to Us

The Columbus Brass Co. Columbus, Ohio.



To The Agent:

We are in a position to take on a few more Agencies, and can promise deliveries in 31 days from receipt of order. Would it not be advantageous for you to add the "Stevens-Duryea" to your line this fall, in anticipation of next year's business?

Think it Over

Catalogue for the asking.

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Lucifer
Gas
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★
As simple to use
and operate as
an oil lamp. Send
for circular about
it and our new
styles of
OIL LAMPS

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R.E. Dietz Co.
37 Lighthouse St.
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ESTABLISHED 1840

Watch the BARBER KEROSENE BURNER This Season.

George C. Cannon, who expects to go the mile under a minute, has decided that this is the best burner made. He says the Barber "gives the hottest fire of any burner, either gasoline or kerosene, now on the market."

POINTS OF SUPERIORITY—Economy. No odor. One-third more heat than gasoline. No smoke. No lighting back. Absolute safety. No clogging of spray nozzle. Carbon deposit easily removed. Fits any steamer. Each burner guaranteed. **Write for prices.**

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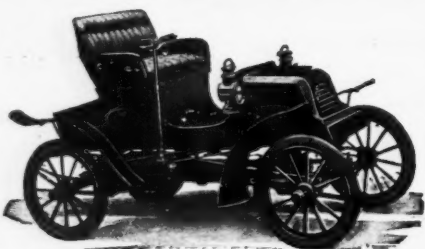
SEAMLESS-STEEL-TUBING
BEST MADE FOR AUTOMOBILE CONSTRUCTION
SEND SPECIFICATIONS - WE QUOTE PRICES
SHELBY STEEL TUBE CO. { MAIN OFFICE
PITTSBURG, PENNA.
BRANCH OFFICES, NEW YORK AND CHICAGO

CRESTMOBILE

For Two Persons,
\$750

For Four Persons,
\$850

Write for Illustrated
Catalogs and be
Convinced of the
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AIR COOLED—CHAINLESS

CREST MFG. CO., 196 Broadway, Cambridge, Mass.

Aluminum or Wood Bodies

For manufacturers or for individual purchasers of either American or European chassis.—We make only the finest, both in design and in workmanship and finish :: :: :: :: ::

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OIL TEMPERED. HAND FITTED.



ALL KINDS FOR AUTOMOBILES

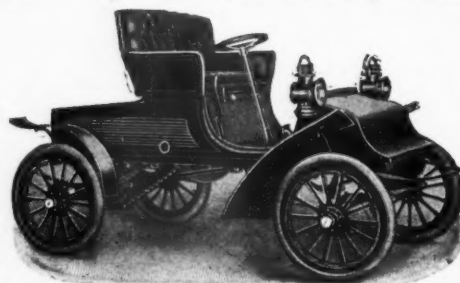
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8 Full Horsepower
At Price of 6.

More power—more leg room—more seat room—more storage—simpler adjustment—better trimming—finer finish and less complications than on any other Runabout.

Our confidential introduction price will get your sample order and hold your business for the season. Write today for proposition.

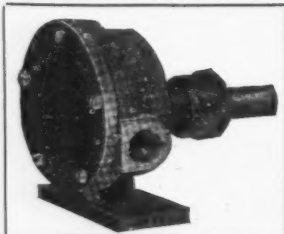


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Absolutely Immediate Delivery.

FLINT AUTOMOBILE CO., - FLINT, MICH.

Improve Your Circulation!



Our No. 1 and No. 2 Positive Pumps will do it. The most simple yet positive pumps for circulating oil or water. All brass except shaft, which is of steel.

Our Prices are Right.
Write for Quantity Prices.

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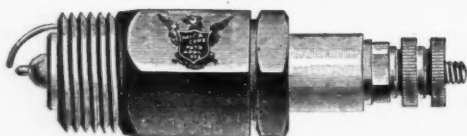


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is the above trade mark. It shows that we cut the gears on which it appears and guarantee them to be the accurate kind that transmit power with the minimum amount of waste. Let us quote you prices.

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AMERICAN Indestructible Sparking Plugs



Stand the Test where all others are Knocked Out of Business. Every one we sell brings us more business. This fact shows what they are. The Original and Only Double Insulated Pure Mica Core. All others are worthless imitations.

AMERICAN COIL COMPANY
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KINGSTON CARBURETER



Gives perfect control over motor and furnishes perfect and uniform mixture at all speeds.

Throttle consists of fuel needle-point valve and air regulating valve, both acting together by one lever.

Byrne, Kingston & Co.

Patented May 12th, 1903.
Other Patents Pending.

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A Quick Start,

a swift, smooth run and
a safe return characterize

National Electric Vehicles

The most serviceable autos for everyday use. Extremely simple in construction and operation. Powerful batteries. Ready to go at any time without tinkering. Any member of the family can handle a National.

Live Representatives Wanted in Unassigned Territory.

Our catalogue shows the latest models.

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The JONES-CORBIN THE HIT OF 1903.

Speedy and Beautiful in Finish.

Our Model A has 8 h. p. De Dion Motor with sliding transmission, three speeds and reverse and lists at \$1,250

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The Jones-Corbin Co.

304 N. BROAD ST., - PHILADELPHIA.

Autolyte No. 22

Brass, heavily nickel plated.
Built especially for small
Automobiles. Burns $\frac{1}{2}$ foot
tip for 7 hours.

Ask Your Dealer

Lamp and Generator \$15.

A. H. FUNKE,

325 BROADWAY, . NEW YORK



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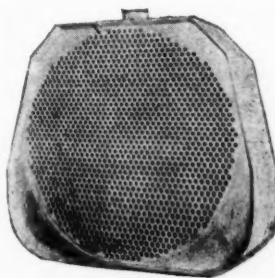
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\$2.00 a Year

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Tubular Water
Coolers a Specialty

HOODS, FENDERS, RADIATORS,
GASOLINE TANKS, WATER
TANKS, ETC . . .

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E. J. AUTOLIGHT \$7.50



WITH GENERATOR \$15.00
gives as powerful a light as any
lamp made. Burns for 8 hours.

E. J. SPARK GAP 50c.

Points enclosed in glass tube.

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Been Tinkering Your Auto?

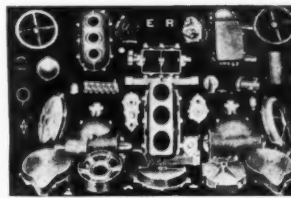
Use GRE-SOLVENT

It instantly dissolves and re-moves the blackest grease, leaving your hands white and smooth. No acids, no alkalis. Harmless. Collapsible tubes or tin boxes by mail pre-paid 15 cents and 26 cents.

Samples Free

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DYKE'S
Aluminum, Bronze
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WE ALSO MAKE PATTERNS

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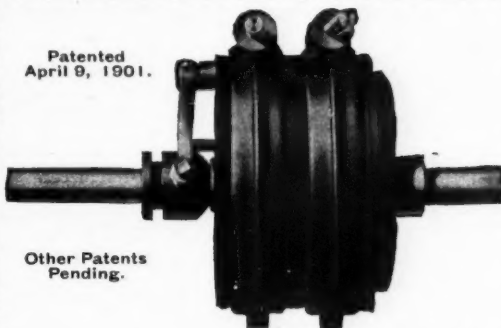
Will make any spark plug
spark. Money refunded
if not satisfactory.

Send 50 cents for one today

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Patented
April 9, 1901.



Other Patents
Pending.

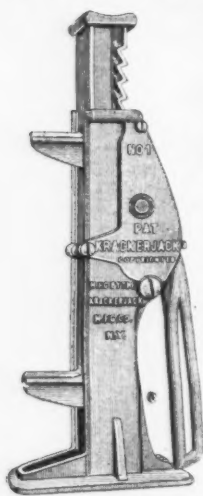
THE BALL Transmission Gear

Two Forward Speeds and a Reverse.
Made entirely of Spur Gears cut
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No Internal or Bevel Gears.

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Have You Seen the New Jack? IT'S A KRACK-A-JACK



Automatic.
Double-acting.
Small Space.
Cheapest and Lightest
Made.
Lifts One Ton.
Three Lifts.
Weight, 7 lbs.

Manufactured under Holahan Patent.
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Agents for Jones-Corbin Co.

The Most Popular Coil on the Market.

The name

"DOW"

Speaks for itself. (Short, but oh my!)



Write for Catalogue to the

Dow Portable Electric Co.
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Price Everywhere, \$1.50

Has double porcelain air space and protected point. It is the best known and most generally used plug in America, and is guaranteed by us to **Stay Right** longer than any other plug at any price. American and French sizes. Buy of your dealer, or

154 Jefferson Avenue, DETROIT MOTOR WORKS DETROIT, MICH.

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THE "SPIT-FIRE" PLUG



Wonderful Results.
A trial is conclusive.
Reversible insulation.
Double life.
Any length of spark by accurate screw adjustment. No platinum to bend, none to break. Energetic ignition, greater power.
Protected porcelain. Protected sparking points.

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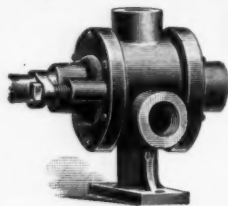
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Ideal Gasoline Car for City and Country Use. Write for 1903 Catalog and Prices.

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Improve your circulation by using the



LOBEE PUMP

Increases and gives a positive circulation to the cooling water for all Gasoline Motors. Simple, Cheap, Durable, Efficient, easy to apply. Over 2,000 in use.

Sent on trial to responsible parties.

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YOU WANT IT.



Our Double Cylinder
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\$150.00

Or Castings and Blue
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We make over
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Mobile Company of America

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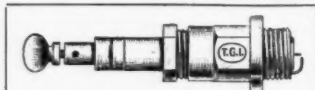
35,000 in Use.

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SOLE UNITED STATES AGENT,

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T.G.I. Spark Plug



Metric: 1/2 inch and 3/4 inch G. P. T

The T. G. I. Spark Plug is not "Soot-proof," nor Unbreakable, but is used in preference to others in thousands of Automobiles in this country, because it gives the most uniformly satisfactory results. Immediate deliveries in any quantities.

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SAVE TIRES

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"EXCELSIOR" TIRE PROTECTOR

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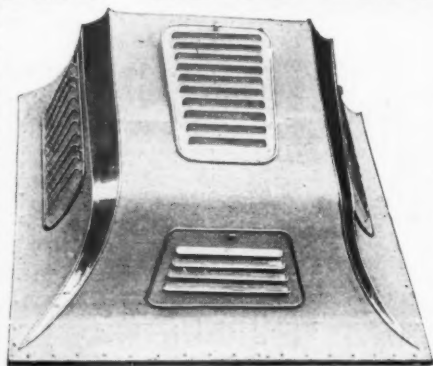


No Punctures, because it removes nails or tacks on first revolution of wheel. Write for prices and testimonials.

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METAL HOOD



We manufacture in our own shops Automobile Bodies, Running Gears, Metal and Wood Hoods, Fenders, Air, Gasoline and Water Tanks, and we sell at factory prices Automobile Parts of every description. We will send you ready to be assembled all parts of any machine, either of your own design or ours.

OUR SECOND CATALOG FOR 1903

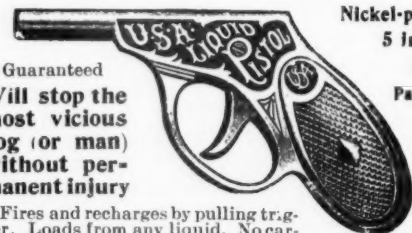
is devoted chiefly to Bodies of many new and attractive designs for both passenger and commercial purposes. Write for it.

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Liquid Pistol



Nickel-plated
5 inches
long.
Patented

Guaranteed
Will stop the
most vicious
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without per-
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Fires and recharges by pulling trigger. Loads from any liquid. No cartridges required. Over 10 shots in one loading. Valuable to automobilists, unescorted ladies, cashiers, homes, etc. By mail 50 cents.

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How much trouble would be saved by using a



"Soot Proof Spark Plug"

You would not be without it

C. A. MEZGER, 203 West 80th St. New York

The Stroud Spark Plug Saver

Reasons why you should have one:

1. It prevents deposit of oil in Spark Plug.
2. It prevents deposit of carbon in Spark Plug.
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It is adapted for use on all gasoline engines using the Spark Plug system of ignition. Made in standard sizes. Sent on receipt of price, \$2.25, prepaid to any address
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Applicable to Any Motor Bicycle

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THE FINEST TOURING CAR BUILT.

Quick Delivery.

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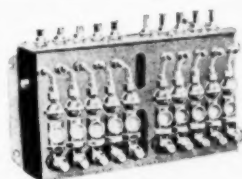
Exclusive Concessionaire for America of
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Vertical engine in front, 6 H. P. sliding gears, 4 speeds, 800 lbs. The finest Runabout in America. Full description in Motor Age July 2. Price \$150. Agents wanted. Liberal discount to trade. Vertical 6 H. P. and horizontal 10 H. P. engines, sliding gears and planetary transmissions for sale.

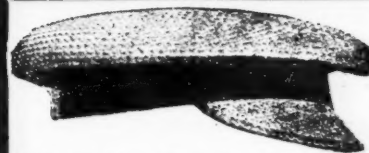
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Obtains Ideal Results.
Manufacturers Send for Estimates.

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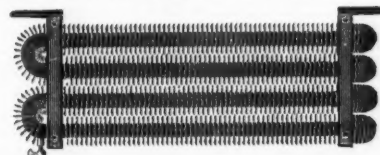


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Latest
White
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Caps,
\$1.50.

Order Quick. They Are Going Fast.

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By Using my
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8 H. P., 2 Cyl.
ALUMINUM CASE,
GOVERNED.

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HERE ARE THE TWO-CYCLE MOTOR castings you are looking for; 3x3-in.; plenty of power for big motor cycle; two motors coupled will run a small automobile; castings with full size blue prints, \$10; aluminum case, \$12; with cylinders, piston and rings machined, \$5 extra. Write for quantity price. Joseph A. Hemingway, Glenwood, Ill.

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FOR SALE—Automobile steam engine, boiler and water tanks, in good running order. Will sell cheap. W. G. Wilson, 1117 Erie St., Port Huron, Mich.

FOR SALE—1902 Model Crestmobile, 3½ h. p., air cooled; only been run 600 miles; as good as new; price, \$300. Geo. E. Rust, What Cheer, Iowa.

FOR SALE—1902 Model Oldsmobile, steel wheels, in fine running order, with all 1903 attachments and improvements. First \$400.00 remittance will take it. Address A. B. C., No. 114 Iowa Ave., Iowa City, Ia.

FOR SALE—1902 Shelby, combination 2 and 4 passenger, 8 h. p.; run about 1,000 miles; good condition. Will sell for \$200, having purchased larger car. Frank Flickinger, Gallon, Ohio.

TRAVELER WANTED—Thoroughly acquainted with the automobile trade, to represent us, selling steel castings. Address with full particulars and reference, Whiteley Steel Co., Muncie, Ind.

FOR SALE—3 seven horse-power American gasoline runabouts, slightly used. Regular price \$850. Make us an offer. Also second-hand Woods runabout in good condition. Pardee & Company, 1404 Michigan Ave., Chicago, Ill.

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FOR SALE—Second hand steam, gasoline and electric automobiles. The largest variety under one roof in America. Send 5c in stamps for catalogue. Mississippi Valley Automobile Co., 3935-3939 Olive St., St. Louis, Mo. tf

FOR SALE—Cheap for cash; 12 H. P. Buffalo Tonneau, 4 H. P. special build runabout, 4 H. P. De Dion motorette, all in first class order and equipped with lamps and extra parts. Machines modeled and built to order by competent mechanics. Engines, running gears and castings for sale. Satisfaction guaranteed. Henry Nyberg, 321 35th St., Phone Oakland 1408.

GENUINE bargains in used automobiles. We have the largest repository and store room in United States. Have forty machines on hand at all times; all descriptions, styles; very lowest prices and each and every one of our machines is in first-class running condition; all worn parts are replaced by new ones. Photographs of each machine sent upon request. We are the pioneers in this business, having opened the first automobile exchange in Chicago. Send for our list. C. A. Coey & Co., 5311 Cottage Grove, Chicago.

SECOND-HAND AUTOMOBILES FOR SALE—Clearing out for spring stock. Electric Vehicle Co., 1421 Michigan Ave., Chicago. 7

FOR SALE—Cheap. Almost new 1903 12 h. p. Toledo Touring Car. Chas. E. Bartley, Chicago.

FOR SALE—Mobile runabout, 1901 pattern, dos-a-dos seat, first class condition. Price \$300. Cash. Address W., Motor Age. tf

FOR SALE—French touring car, 9 h. p., single cylinder, removable tonneau, aluminum body, three speeds forward and reverse; newly painted and overhauled; imported last summer. Photograph on application. Owner has purchased larger car. Address Imported, care Motor Age.

WANTED—Position as sales manager or salesman. Know the trade well and am a practical man. Eighteen years' business experience as office man, traveler and manufacturer. Undoubted references. Gasolene, care Motor Age, 150 Nassau St., New York.

FOR SALE—One Winton "Runabout" with top, in fine condition. Cost \$1,300, 1902 model. Will sell for \$850. Great bargain. Address, Model Gas Engine Co., Auburn, Ind.

FOR SALE—1902 Winton, 9½ h. p., 1800 pounds, single seat and top. All in good order; been used carefully; \$800 cash. M. L. Mayland, M. D., Faribault, Minn.

FOR SALE

1902 AUTOCAR TONNEAU, 10 h. p., chainless.....\$1,250
1902 AUTOCAR TONNEAU, with canopy top and glass front.....\$1,350
1902 AUTOCAR RUNABOUT, 3 1-2 h. p., 2-cylinder engine.....\$450
1902 HAYNES-APPERSON, 9 h. p.....\$1,500
model.....\$600
1903 WOOD'S ELECTRIC, new batteries.....\$500
1903 FRANKLIN, 4-cylinder, brand new.....\$1,100
1903 OLDSMOBILE, wood wheels.....\$100
These cars are not worn out machines bought on speculation, but are warranted to be in first-class condition, having been taken in part payment for new Autocars. The above prices are unusually low, quality considered.
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We have the largest automobile exchange in the U. S. New and second-hand machines of every make. Gasoline runabouts, \$150 to \$650. Touring Cars, \$750 to \$3,000. Steamers \$250 up. Electric \$350 up. Olds, Winton, Autocar, Searchmont, National, Waverley, Locomobile, Packard, Murray and many others. Every machine guaranteed in perfect condition. Photos of the identical machines in stock and descriptions FREE for the asking.

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THE DUNLOP TIRES

Stanley Steam Car wins first award in Mass. Auto Club Hill Climbing Contest, Boston, April 20, with "Dunlops."

Duryea Car wins first award (in gasoline class) in same contest, with "Dunlops."

Knox Delivery Car wins first award in New York Commercial Contest May 20 and 21, with "Dunlops." (Weight of vehicle, 3,500 pounds.)

Stanley Steam Car wins world's mile record at Readville, Mass., May 30, with "Dunlops."

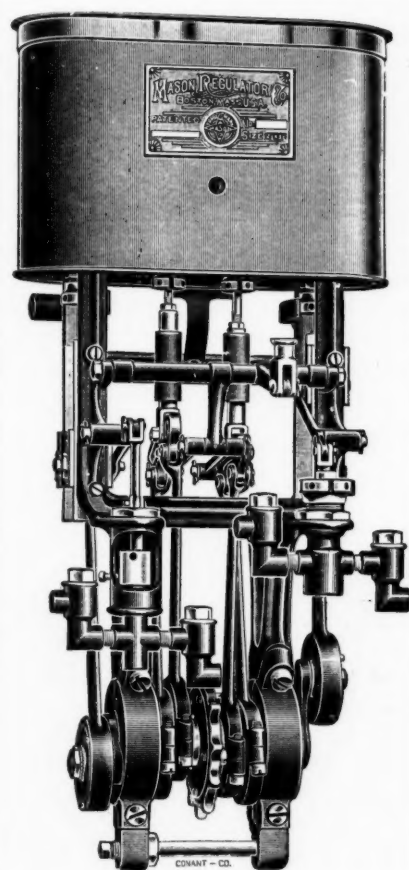
C. H. Curtis Motor Cycle wins first award in New York Motor Cycle Club's Hill Climbing Contest, May 30, with "Dunlops."

B. B. Bird and R. R. Boon each win first awards in Motor Cycle Endurance Contest, New York to Worcester, July 3, 4, 5 and 6, with "Dunlops."

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of Motor Vehicles. ♦ ♦ ♦

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Dr. H. Nelson Jackson, one of the best known surgeons of the country, a resident of Vermont, has completed his great trans-continental ride. This distinguished automobilist, who is in no way connected with the automobile industry, undertook the ocean to ocean ride as a means of pleasure and recreation.

It was a regular model car, purchased by Dr. Jackson from a private owner and at a premium over the regular price of \$2,500.

When he arrived in Cleveland, en route to New York, the motor was in such splendid condition that he would not allow it to go into the Winton factory for a "looking over."

It had gone up and over the high Sierras, traversed the Great Desert, climbed the rugged ascents and threaded the dangerous passes of the Rocky Mountains, rolled over the plains of Nebraska, ploughed through the black mud roads of Iowa, but its condition when Cleveland was reached necessitated no factory inspection. -

This record is the more remarkable when it is considered that no factory mechanic accompanied Dr. Jackson, and that he had no system of relays for duplicate parts along the route.

It is the greatest performance ever made by an automobile in America, and Dr. Jackson has consented to write the complete record of the trip. It will be interesting not alone for the descriptive matter contained but on account of the attractive illustrations, reproduced from photographs taken by Dr. Jackson, which will constitute part of the record. It is "The Trans-Continental Record." We will mail it upon application.

The Winton Motor Carriage Co

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